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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 16 1954

STUDIES OF A GENERAL PRACTICE (II)*

THE DOCTOR'S JOB IN AN URBAN AREA

BY

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(From the Social Medicine Research Unit of the Medical Research Council)

In the course of a study of the various methods which can be used to investigate general practice, the activities of a single National Health Service practice were followed for one year. This paper presents results selected from the study, to describe some of the more *quantitative* aspects of the doctor's job in connexion with his patients and their diseases.

Because the study had as its main purpose an assessment of the various methods which could be used, it was not thought necessary (nor was it a practical possibility) to try them out, to begin with, in more than one place. For this reason no attempt has been made to generalize from the results here presented, for they show only what went on in this one practice. They are put forward in much the same manner as a clinical case study is put forward, to suggest how one part of the doctor's job may be described and measured, and to illustrate some ways of thinking about what may be happening in an urban practice and in the medical care of some 3,000 ordinary people.

The Practice

During the year of the study (April, 1950, to March, 1951) the practice had an average population of 3,084 registered persons and was increasing slightly in size. Of these persons 72% consulted the doctor during the year. Working with the principal was a trainee assistant, and there was also available the occasional help of another practitioner, who lived on the outskirts of the practice and who undertook a few visits and surgeries by arrangement. A prefabricated building in the garden was used as a waiting-room and contained also an additional surgery for the trainee assistant and a small office for the part-time receptionist-secretary. The practice, which was situated in a North-west London borough, was highly concentrated, in that some 95% of registered individuals lived within a mile of the surgery, over which the principal was living. The area is mainly residential, but the terraced houses are interspersed with numerous small factories and laundries. It is a relatively poor area where much of the housing is scheduled for demolition and an impressive rehousing programme has already started. During the period of study the practice probably had much the same age, sex, and occupational pattern as the immediate local population, but it was somewhat poorer than the borough as a whole.

Method of Study

The principal and his assistants became part-time members of the team which was conducting the study, and undertook to supply records of their work throughout the test year. The necessary recording took place in three stages.

(1) The age, sex, and social characteristics of the population were ascertained and recorded, and the existing records brought up to date. This was a considerable task, because it entailed many home visits and at least one letter to every registered person. It was made difficult also because, unknown to the executive council or to the doctor, the council's records contained the names of 15% more persons than were actually found to be present in the practice. The medical record envelopes in the surgery files exceeded the number of persons present by even more than this large amount of "official inflation," and contained about 19% more than the total, thus rendering useless nearly one M.R.E. in five.

(2) A simple basic form was completed by each doctor after every consultation. This form served to identify the patient and doctor concerned, the time and place of the consultation, whether in the patient's home or in the surgery, the diagnoses made, and the services rendered. In addition, every six weeks, for one week, members of the research team "sat in" on all consultations and recorded in greater detail what went on. The detail included records of telephone conversations, the writing of letters, preparation of lists of patients to be visited, and so on. The collection of these more intensive records gave a rest to the doctors and acted as a "control" as well as an amplification of the simpler records. As a result of this control it is estimated that

*The first paper, a description of method, was the subject of a discussion in the General Practice and Epidemiological Sections of the Royal Society of Medicine (Backett, Shaw, and Evans, 1953).

TABLE I.—*Number of Consultations in Surgery and as Visits, Distinguishing Age and Sex of Patient and Percentage of Visits*

Consultations	Age Group in Years								Total (All Ages)		
	0–14		15–44		45–64		65+				
	M	F	M	F	M	F	M	F	M	F	
In the surgery (*a*) ..	1,012	947	1,854	2,499	1,053	1,531	502	706	4,421	5,683	15,695
As visits (*b*)	877	1,073	474	605	563	569	463	967	2,377	3,214	
Percentage of visits in total of (*a*)+(*b*) ..	46%	53%	20%	19%	35%	27%	48%	58%	35%	36%	

This table excludes the 93 consultations which took place other than in the surgery or at visits. The grand total is, 15,695—that is 15,788−93.
The average population of the practice was 3,084.
All tables and figures refer to the year April 1, 1950, to March 31, 1951, in a N.W. London practice.

over 99% of all consultations were recorded. The doctors were encouraged to make many notes, and, perhaps because the record card usually took less than one minute to complete and stated only the barest minimum, this was often done. These notes later proved particularly useful in sample studies, designed to test the value of various ways of classifying the material.

(3) All records of consultations were transcribed on to *patient record cards*, which thus came to contain the health histories of each registered individual in the practice during the year. All the items on these patient records were then classified and cards for machine tabulation were prepared.

The basic records were adequate to describe the work of the doctor in terms of the main services involved. Every six weeks there was far greater detail available from the intensive records mentioned above, and to fill out these two pictures sample studies of consultation timing, of the extent of the use of apparatus, elementary time and motion studies of the doctor's day, and a fuller inquiry into the health of a random sample of the families in the practice were undertaken. While results from these other studies are not included in this paper, it is recognized that without such additional material the job of the busy G.P. cannot adequately be described.

The Unit of Work

It is possible to relate the doctor's work, the type of disease, and the patient, through a series of simple codes if the consultation is taken as the basic unit of work. The term "consultation" includes all meetings between doctor and patient in which advice was given, whether such meetings were by chance or arrangement, and it also includes meetings between doctor and patient while the latter was in hospital, telephone inquiries, and the like. During the year of study 15,788 of these consultations took place. This number, with the services involved, letters, referrals, prescriptions, etc., represented 100% of the work of the doctors for the purposes of this part of the study. It is well recognized that this may be by no means all the work of the practice, but sample analyses of the more detailed records suggest that this way of organizing the material embraces almost all of the doctor's job *that can easily be measured*. Purposely omitted is the maintenance of equipment and the many other chores which, though playing some part in terms of both time and energy, are not specifically associated with the doctor's work with his patients. Also omitted are some of the "social-work" aspects of his job, which it is hoped to discuss elsewhere. Selected results from the analyses are presented below. They show where and when the consultations took place, with what groups of patients, and with what diseases and groups of diseases. Finally, some of the services which were rendered during consultations are mentioned, and two tables are presented which link the work done in the practice with groups of patients suffering from various types of disease.

Place and Time

Most of the 15,788 consultations took place during the normal working day, but 120 were made at night, between 8 p.m. and 8 a.m., the large majority before midnight. During so-called "off duty" periods at week-ends or during bank holidays 140 consultations took place.

The number of consultations which are held in the patient's home reflects several important aspects of the doctor's job. First, the apparent or real seriousness and urgency of the case may be reflected in this figure. Second, it may show how much time is available to the doctor and indicate how busy he is (distances from the surgery are hardly important in this closely knit practice). And, finally, it is reasonable to speculate—as McKinlay (1950) does in connexion with visits to the elderly—that the extent of intimate understanding of the family situation which comes from visits to the homes of his patients will be reflected in this figure. Thus the proportion of these visits in the whole of his work may help to illustrate, albeit crudely, the quality of his care.

In order to explore these ideas further, the proportion of all consultations which took place in the patient's home has been made the basis of a series of tabulations. It will be recognized at once that this proportion is of use only when comparing habits of work with populations roughly comparable for need and custom; and comparison, for example, of a middle-class and a working-class practice in this way might well be useless. In the practice under observation 36% of all consultations were made in the patient's home, a figure which is comparable to that given by Pemberton (1949). The distribution of this percentage for both sexes and at different ages (Table I) shows that a large proportion —some 50% of all the work involved in treating the children and the elderly—was carried out in the patient's home, compared with about 20% among the younger adults.

Work in Treating Different Groups of Patients

With the exception of a small number of persons (1.7%) for whom occupational data were not available, the age, sex, and social characteristics of every registered individual were known. These data were related to the number of consultations and to the "contents" of the consultations, such as the number of prescriptions, etc.

Fig. 1 shows the consultation rate for the year per 100 registered persons for each sex at different ages. It shows how the work of the doctor is related to the age of his patients and the excess of work (measured as consultations) with females over that with males. The excess in the consultation rate for children (aged 0–14) over that for young adults can be very largely explained by a great excess amongst the very young children (aged 0–4), though this is not the complete explanation for the boys.

If the work of the practice is divided among those registered it gives an average of some five consultations per *registered person* in the year, a figure comparable to that found by McGregor (1950), and by Bradford Hill (1951) for 1938, and somewhat in excess of that found by Fry (1952). Since 28% of these registered persons were either not ill or not ill enough to consult the doctors during the year, the more realistic average is seven for each *patient*. Even such a

corrected average may be misleading and a more realistic picture of the use made of the doctors' services emerges only when the percentage of persons having various numbers of consultations is examined.

The percentage of all the males in the practice who had no contact with the doctors in the year is greater at each age than the percentage of females. At the extremes of age this difference is less marked than between 15 and 64 years. Among children aged 0–4 years only 12% did not see the doctor at least once in the year. Among persons who saw the doctors at all, more consulted them on one occasion than on two, and more on two than on three, and so on (Fig. 2). In other words, the most frequently occurring number of consultations for any person was one, and the next most frequent two.

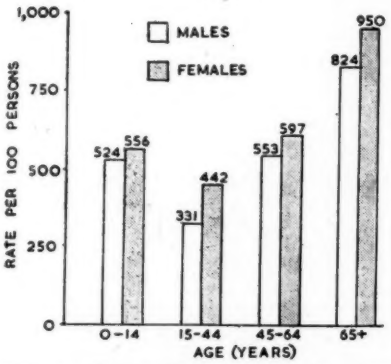

FIG. 1.—Consultation rate for the year per 100 persons registered. 3,084 persons and 15,788 consultations are represented.

Fifty-six per cent. of males and 46% of females consulted the doctors on fewer than three occasions—that is, not at all, once, or twice—while in contrast 13% of males and 18% of females consulted on 10 or more occasions. Some patients, however, contributed proportionately much more than others to the work of the practice: of those aged 65 and over (rather under 10% of the practice), 25% of the males and 32% of the females saw their doctor on 10 or more occasions in the year. Moreover, nearly one in eight of these elderly people had 20 or more consultations.

Table III shows the approximate proportion of all the work of the practice which is involved with patients consulting various numbers of times. This idea is further illustrated in Fig. 3.

It will be seen that 12% of the work of the doctors among children, for example, was involved with that 3% of persons who had 20 or more consultations, which was four times the average number of contacts for that age group (5). Or again, while only one-fifth of the middle-aged men and

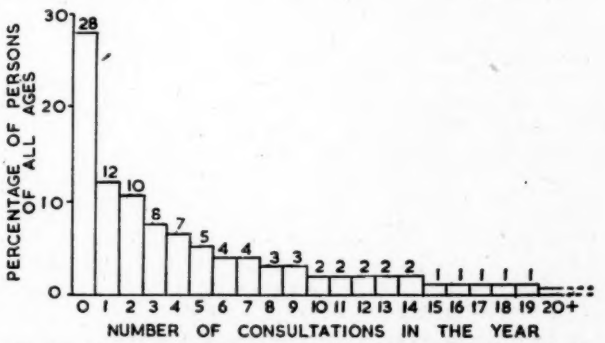

FIG. 2.—Percentage of persons having various numbers of consultations in the year. Note: (1) The chart is based upon the number of persons registered for at least the whole year—that is, upon 2,844 persons. (2) The percentages shown are "rounded off" to the nearest whole number. (3) 4% of the population had 20 or more consultations in the year.

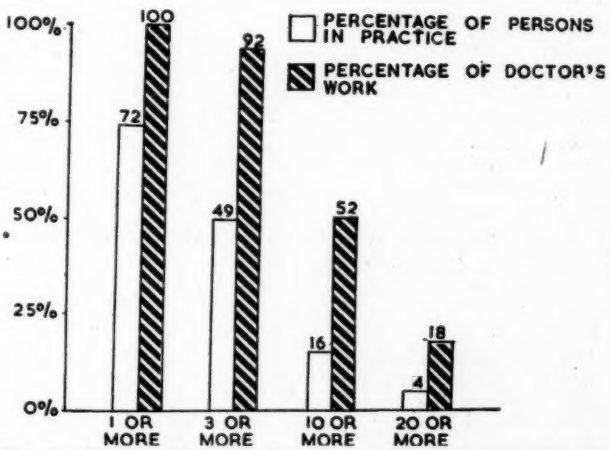

FIG. 3.—Number of consultations in the year. The proportion of persons and the work involved in treating them (summary of Table III). Note: (1) The columns show the relative proportion of persons and work for different numbers of consultations in the year. (2) The figures are for all ages together. (3) The figures are based upon information about persons registered for the whole year—that is, 2,844 persons.

TABLE II.—*Percentage of Persons of Each Sex in Each Age Group Having Various Numbers of Consultations with the Doctor in the Year*

Age Group	Percentage of Persons with Stated Number of Consultations							
	None		1–2		10–19		20 or More	
	M	F	M	F	M	F	M	F
0–14 years ..	24	20	19	16	13	18	4	2
15–44 ,, ..	35	25	28	26	6	11	1	2
45–64 ,, ..	36	27	22	19	10	15	6	6
65+ ,, ..	29	25	18	21	14	18	11	14
All ages ..	32	24	24	22	9	14	4	4

Only the extremes of the distribution are shown. Omitted from each age and sex group are those clustering round the mean, namely the percentage of persons who had between 3 and 9 consultations in the year.

Each figure is the percentage in the age group indicated of all persons of that sex.

Table based upon the number of persons registered for at least the whole year—that is, 2,844 persons.

TABLE III.—*Number of Consultations in the Year. Proportion of Persons and the Work Involved in Treating Them*

No. of Consultations	Age Group in Years								All Ages	
	0–14		15–44		45–64		65+			
	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved
None ..	22	0	30	0	31	0	27	0	28	0
1 or more ..	78	100	70	100	69	100	73	100	72	100
3 ,, ,, ..	60	95	43	88	49	94	54	96	49	92
10 ,, ,, ..	19	50	10	38	19	61	29	74	16	52
20 ,, ,, ..	3	12	2	9	6	26	13	40	4	18

(*a*) Is the number of persons in the age group with the stated number of consultations in the year, expressed as a percentage of all the persons in the age group.

(*b*) Is the work involved in treating the persons in (*a*) expressed as a percentage of all the work with the age group. (*b*) Cannot be precise because tabulation of the work involved with each separate number of consultations was prohibitive. The figures given are approximate.

The figures are based upon information about persons registered for at least the whole year, or who died during the year—that is, 2,844 persons.

women in the practice saw the doctor on 10 or more occasions during the year, three-fifths of all the work involved with this age group was concerned with this relatively small number of people (19% of people, 61% of work). Similarly, while 29% of the elderly saw the doctor on 10 or more occasions, these were responsible for 74% of the work with that age group. Taking the practice as a whole, half of all the work involved only that sixth of all the patients (some 500) who saw the doctors on 10 or more occasions, and 18% of all the work concerned only 4% of the patients (125) who consulted 20 times or more.

Work in Treating Different Types of Disease

Diagnoses were classified by a short list of 28 categories arranged to permit comparison with other lists in more general use. As an attempt to explore further the implications of the various diseases and to develop methods of study of their effects upon the individual and family, each diagnosis was also classified according to its *seriousness* and its *duration*. Serious diagnoses were of diseases in which there was evidence of a major threat to the life or livelihood of the patient or which required considerable readjustment in his life or that of his family. Each of these criteria was, of course, further defined operationally. Such conditions as pulmonary tuberculosis, cancer, established peptic ulcer, and pneumonia were always classified as serious. It was realized that a definition such as this, based in part on other than purely medical concepts of seriousness, might include many diagnoses which were not serious when judged from a pathological point of view. In practice this effect was found to be very small, for the large majority of serious conditions as defined reflected major organic disease.

Again, certain conditions were always regarded as chronic, and other conditions were placed in this category only when there was evidence of a duration of three months or more. Conditions which were chronic by definition included organic heart disease, bronchiectasis, varicose veins, and the like. All other conditions were classed as acute and were further divided into acute infective and acute non-infective conditions. From this classification it will be seen that each diagnosis made at a consultation, which was, of course, counted only once during the year, could be described in three ways: (1) as belonging to one of the 28 elements in the diagnosis code; (2) as being acute infective, acute non-infective, or chronic; and (3) as being either serious or not serious.

Where more than one diagnosis was made at a consultation it is not possible to say what fraction of the consultation was concerned with which diagnosis. It is therefore not possible to state with any precision what proportion of all the consultations in the year was concerned with any given diagnosis group. But the range or limits between which this proportion lies can be shown by dividing all consultations into (*a*) those in which the given diagnosis occurs on its own, and (*b*) those in which it occurs together with at least one other diagnosis: (a) is a minimum count of all the work concerned with the given diagnosis, and (a+b) a maximum count. Expressing (a) and (a+b) then as a percentage of all consultations gives a minimum and maximum to the percentage of work involved with the given diagnosis. For example, the common cold, *when it occurred alone*, was the diagnosis in 4% of all consultations. The proportion of consultations in which the common cold occurred *either* alone or with some other condition was 8.5%; the range was therefore between 4 and 8.5% of the total work for the year.

Diagnoses of interest in this respect are peptic ulcer and chronic or recurrent dyspepsia, which accounted for 1% of all diagnoses and involved between 1 and 4% of the work of the practice. Psychiatric diagnoses (5% of the total) often occurred with other diagnoses, and involved between 1 and 7% of the work, while cardiac and vascular conditions (excluding varicose veins) were 3% of all diagnoses and entailed between 2 and 10% of the work of the practice.

Skin disease was indicated in 11% of all diagnoses and involved between 6 and 12% of the work. Some 5% of diagnoses were of arthritis, fibrositis, rheumatism, etc., and these involved between 3 and 8% of the work of the practice. For acute respiratory infections, which were rather less than one-third of all diagnoses, it was only possible to state that they accounted for between 20 and 40% of the work of the practice. These wide limits are, of course, a measure of the frequency with which these infections occur together with some other condition.

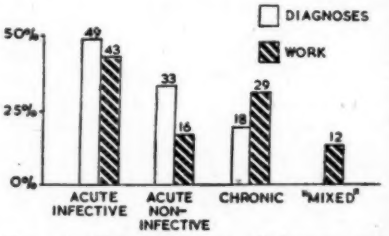

FIG. 4.—Percentage of diagnoses and consultations showing broadly the type and duration of the condition diagnosed. Note: (1) Each single diagnosis is classed as either acute infective, acute non-infective, or chronic. (2) There may be several diagnoses in any one consultation. Where several diagnoses are made and these come from more than one of the three broad groups seen above, the consultation is referred to as work with "mixed" diagnoses. 12% of all consultations fell into this category. (3) Because of this the percentage of consultations with acute infective, acute non-infective, and chronic conditions will be seen to represent an approximate and minimal figure. (4) The total of 6,122 diagnoses upon which this chart is based excludes 85 "diagnoses" in which there was no illness and preventive inoculation was involved. The 144 consultations which were concerned with these 85 "diagnoses" are also omitted.

When the work of the practice is classified by diagnoses in this way, there is a large measure of agreement between the proportion of all the diagnoses which fall into each group and the proportion of the work of the practice which was involved. The picture which this classification by itself gives of the work of the doctor is not a good one, and it is more likely to prove useful when there is added a qualitative description in terms of the seriousness and duration of the conditions which have been treated.

Fig. 4 shows the percentage of 15,788 consultations classified as work with diseases grouped as acute infective, acute non-infective, or chronic, and also the relative proportions of consultations and diagnoses. In 12% of consultations, diagnoses from more than one of these three groups were made—for example, an acute infective condition and a chronic condition at the same time. These consultations have been referred to as work with "mixed" conditions. No attempt has been made to break them down further, although it is recognized that fractions of such consultations "belong" to the main groups concerned.

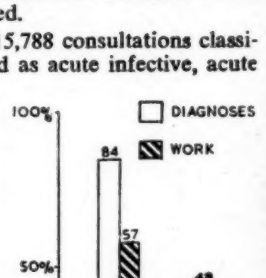

FIG. 5.—Percentage of diagnoses and consultations showing the seriousness of the condition diagnosed. Note: (1) Each diagnosis was classed as either serious or not serious. (2) Each consultation was classed as serious if one of the diagnoses made during it was serious. (3) Prophylaxis is omitted from the totals of "diagnoses" and consultations. The figure is based, therefore, upon 6,122 diagnoses and 15,644 consultations.

It will be seen that the care of chronic disease, which formed less than 20% of the diagnoses made by the doctors in this practice, involved at least 30% of all their consultations and, because of the contribution of the work with "mixed" diagnoses, probably rather more. Almost half of all the diagnoses made were of acute infective conditions, and roughly the same proportion of all the work of the practice was involved in treating them. When diagnoses and work are classified by the seriousness of the condition the disproportion between the number of diagnoses and the amount of work is more striking.

Fig. 5 shows this most important contrast. While only 16% of diagnoses were considered to be "serious," the work involved in dealing with them amounted to 43% of all the work of the practice for the whole year.

Services

The services which were rendered during a consultation have been analysed initially under the headings of examination, prescription, referral to hospital or some other agency, certificates of various types, and non-medical advice and help. Each of these groups of services has been examined in much greater detail for one week in every six, and full consideration of them in this practice must wait upon an analysis of this material. Preliminary review suggests that the findings in this study will not exceed greatly the figures reported by Fry (1952) and others. For example, at least one certificate was given for every 4.5 consultations, and only about half of these were National Insurance certificates. Referrals outside the practice were at the rate of rather over 35 for every 100 registered persons in the year, and most of these patients were referred only once. It is of interest to note that the referral rate at ages for each sex shows a maximum of 57 per 100 persons in elderly males, the comparable group of elderly females having only 38 referrals per 100 persons during the year.

During 10,889 out of 15,788 consultations, one, or more than one, prescription was made. This is equal to a prescription rate of about 7 for every 10 contacts with the doctor or at least five prescriptions for every person who consulted the doctors during the year, and rather under four for every person registered.

Prescription rates when analysed according to the seriousness and duration of the condition concerned go further to describe the prescribing habits in this practice. Prescriptions were given in 73% of "non-serious" consultations (based, of course, upon the "seriousness" of the diagnoses made during the consultation) and in only 65% of "serious" consultations. These differences in the amount of prescribing during serious and non-serious work were found whether the work was with diagnoses of acute infective, acute non-infective, or chronic conditions. Many of the serious acute non-infective conditions, such as injuries, will of course be referred to hospital or casualty clinic without need of a prescription, and this may explain the difference in this group. No such simple explanation is to hand for the larger amount of prescribing in the other less serious groups. It is possible that the difference here is due partly to hospital prescribing for those more seriously ill and partly to the longer duration of serious illnesses; the number of prescriptions in each *episode* of illness being more nearly constant.*

Work in Treating Groups of Patients with Various Diseases

The recording system which was used, and which has been briefly described above, allows not only the relating of the doctors' work to groups of patients and then to the groups of diseases, but the production of tables which show how much work was done with the different groups of patients when they were suffering from various types of disease. In this way it is possible to build up further the picture of the role of the G.P. in this "population." Table IV gives the proportion of persons, diagnoses, and consultations which occupied the doctors of this practice during the year, and shows that, of all patients, the young adult involved them in the smallest amount of work.

It will be seen that there were proportionately slightly more diagnoses made among the male children, but that th[i]s involved the doctor in much the same proportion of consultations as might be expected from the number of persons concerned (however, the large number of visits which were made to the homes of children must not be forgotten). At the other end of the age range, as might be expected, for the elderly, the number of diagnoses was not strikingly disproportionate, yet the work involved was in excess of that to be expected upon the basis of the numbers of persons of that age (and, again, the number of visits was disproportionately high).

*In order to examine this and kindred suggestions the material from the study is being analysed to show the number of *episodes of illness* as well as upon the basis of the consultation, diagnosis, etc.

TABLE IV.—*Percentage of Persons, Diagnoses, and Consultations Showing for Each Sex the Proportions at Different Ages*

	Age Group in Years								Total	
	0–14		15–44		45–64		65+		All Ages	
	M	F	M	F	M	F	M	F	M	F
Registered persons ..	24	23	48	44	20	22	8	11	100	100
Diagnoses	32	23	40	43	18	22	10	12	100	100
Consultations.. ..	28	23	34	35	24	23	14	19	100	100

3,084 persons are represented. This is the average population for the year. Prophylaxis is omitted from the totals of diagnoses and consultations. The table is based, therefore, upon 6,122 diagnoses and 15,644 consultations.

As has been shown, there was more work in this practice with females than with males, and this was due to a greater use of the doctors' services by the women, as well as to the larger number of them who were registered (on the average each female consulting the doctor did so approximately once a year more often than each male). Comparison of the proportion of work with each sex that was involved in treating various types of illness shows a marked similarity throughout. In both males and females the milder acute infections occupied nearly one-third of the consultations (33% in males, 31% in females). The next largest group was the serious chronic conditions, which involved 25% of the doctors' work with males and 22% of the work with females. Serious acute infections involved roughly the same proportion of the work with males as with females (12% for males and 10% for females).

Such averages are of course subject to great variation with age, and examination of the relative amount of work involved in treating different types of disease at various ages emphasizes this (Table V).

TABLE V.—*Percentage of Consultations at Different Ages Showing Type and Seriousness of the Condition Concerned*

Age of Patient (Years)	Seriousness	Type of Condition				Total
		Acute Infective	Acute Non-infective	Chronic	"Mixed"	
0–14	S	17	0	1	2	100
	NS	64	12	1	3	
15–44	S	7	3	18	6	100
	NS	32	21	6	7	
45–64	S	10	2	34	9	100
	NS	16	13	10	6	
65+	S	10	2	53	11	100
	NS	7	7	7	3	
All ages	S	11	2	23	7	100
	NS	32	14	6	5	

S = Serious. NS = Not serious.
Prophylaxis is omitted. 15,644 consultations are represented.

The doctors spent proportionately more time on the treatment of the acute non-infectious conditions, such as injuries, in the younger adults than they did with any other age group, yet these young people caused them less work than patients of other ages. Again, the non-serious acute infections of children are seen to occupy nearly two-thirds of the doctors' consultations with that age group (64%)—twice the average for the whole practice. At the other end of the scale, over half the work with elderly folk (53%) was in treating serious chronic conditions—over twice the average for the practice.

Comment

Four much-discussed aspects of the work of the general practitioner have been measured and illustrated by examples from this particular practice. They are the concentration

of a large proportion of the work among a relatively small number of patients, the large amount of work with serious disease, the large amount with chronic disease, and the effect of the age of the patient upon the amount and type of work.

Concentration

The 16% of registered persons who were responsible for over half of the work of the doctors may be regarded, for this year at least, as the "hard core" of sick people in this practice. It might be thought that these people, who were more often and more seriously ill than the general run of patients, were a group of elderly and chronic sick for whom, perhaps, little could be done, yet over half of them were under 45 years of age and more than a quarter were children. The presence of this relatively large group of younger people, for whom treatment necessarily holds more hope, and the fact that they caused about one-quarter of all the work of the practice, draws attention to them as a body of patients of particular interest to the general practitioner. This group would be still more interesting if it could be shown that the same persons or the same families were identified in this way from year to year.

Another way to consider the preventive and therapeutic problems which were presented by this "hard core" is to approach it from the point of view of the number of persons involved—that is, in terms of the *size* of the problem for the G.P. If each person registered with the practice had been equally concerned in the doctor's work, it is unlikely that an intimate and personal knowledge of all the 3,084 would have been possible. However, only three-quarters of those registered caused any work at all, one-sixth were responsible for half of the work, and one-twenty-fifth (125 persons) for one-fifth of the work. In this there is a strong suggestion that the *size* of the doctor's list was, in this case, a poor indication of the number of persons among whom the bulk of the work was distributed. Moreover, since the 500 persons responsible for half the work had in fact an average of 16 consultations each, these general practitioners had a good opportunity of getting to know them and of practising good medicine with them.

Seriousness

The classification of a diagnosis as "serious" or "not serious" was carried out conservatively, and whenever there was doubt about the category in which to place it the diagnosis was classed as "not serious." The proportion of the total which was finally grouped as "serious" (16%) is not surprising, but the proportion of the work associated with these diagnoses (43% of the total) implies at least that in this case the general practitioners were themselves undertaking a substantial amount of serious work. If similar conditions were found to exist elsewhere it might become possible to refute the implication contained in such statements as "the general practitioner is a specialist in the trivial."

Chronic Disease

About one-third of all the work was with chronic disease. This type of work is often the least rewarding from the point of view of the doctor and the most difficult from the point of view of its attendant social problems, yet in the medical care of the chronic sick the G.P. and the family bear the major part of the responsibility. In this practice the doctors were often the only persons who were in a position to appreciate fully the needs of the family in which there was chronic illness and to co-ordinate the many services which were becoming available. Since the chronic disease burden of an ageing community is likely to increase (at any rate with the present lack of the means of prevention), these doctors must look forward to spending a very substantial part of their time and energy in the treatment of this type of illness.

Influence of Age of Patient

The most frequent users of the doctors' services were those over 65 years of age, with the young children and the middle-aged next, and the younger adults consulting least often. The *extent* of this rather obvious effect of age is seen more clearly than in such generalizations, however, when the duration and seriousness of the work are examined. Thus two important trends with the age of patient were apparent in this practice. In work with children 64% was with non-serious acute infections, while in the elderly only 7% was classified in this way. Serious chronic illness, on the other hand, involved the doctors in only 1% of all work with children but in 53% of the work with those aged over 64. Thus between the extremes of age there was a proportionate difference of some nine times between the amounts of work involved in treating less serious short-term infections and of fifty times in treating serious chronic illness. These examples confirm in numerical terms how important the age composition of the patient population is to the practitioner. From the doctor's point of view the easiest patient on his list is obviously the younger adult, in the treatment of whom a relatively small amount of work is involved, and for whom, as has been shown in Table I, the smallest proportion of visits is undertaken. However, not only do patients of different ages need different amounts of medical care, but (and perhaps more important) the type of work which is involved in giving this care, and the kind of medical interest and satisfaction to be derived from it, differ greatly from age to age.

Summary

The work of a medium-sized practice in North-west London was studied for one year as part of an examination of the different methods which can be used in general practice research. Special records were kept by the doctors concerned and completed after each consultation, which thus became the basic and most easily counted unit of work. The number and "contents" (certificates, prescriptions, etc.) of such consultations were related to the age, sex, and social characteristics of the registered population, and to the diseases from which they suffered. These diseases were classified according to a list of 28 elements, and also as acute or chronic and serious or not serious according to defined criteria. Selected tables and figures are presented to illustrate how such material may be used to answer questions about the amount and type of work that is involved in running a practice of this size. No attempt is made to generalize from this study, but there is no reason to believe that the medical needs of the 3,000 registered persons differed greatly from those of the population of the rest of the borough.

The whole of the work of the practice, so far as this study was concerned, centred upon the 15,788 consultations which took place during the year. This is roughly the same as 100 consultations a week for every 1,000 registered persons. Half of this work was concentrated among 16% of the population (some 500 persons) who consulted the doctor on 10 or more occasions during the year. One-fifth of all the work was accounted for by 4% (some 125 persons) who consulted 20 or more times. Of all the diagnoses made during the year 16% were of serious disease, and the work involved in treating them amounted to 43% of the total work of the practice. Chronic disease caused 30% of the work, and acute infections accounted for another 43%. Much of this latter was in the treatment of acute respiratory infections. Over half of all the work with those aged over 64 was concerned with chronic serious disease, while less than 1% of the work with children was involved with this type of condition. Nearly two-thirds of the work with children was in treating the less serious acute infections, while only 7% of the work with the elderly was of this type.

Prescriptions were given during nearly 11,000 consultations—an average of at least five prescriptions for

every person consulting the doctor, or seven for every ten consultations. At least one certificate was given for every 4.5 consultations, and only about half of them were for official purposes. Referrals were at the rate of 35 per 100 persons in the year, and most of these patients were referred only once. The elderly male patients with a referral rate of 57 per 100 persons were referred most often.

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TRAINING GENERAL PRACTITIONERS IN PSYCHOTHERAPY

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Present Situation Regarding Psychotherapy in General Practice

It is generally agreed that at least one-quarter of the work of the general practitioner consists of psychotherapy pure and simple. Some investigators put the figure at 50%, or even higher; but, whatever the figure may be, the fact remains that the present medical training does not properly equip the practitioner for at least one-quarter of the work he will have to do.

Although the need for a better understanding of psychological problems and for more therapeutic skill is keenly felt by many practitioners, they are reluctant to accept professional responsibility in this direction. The most frequent reason advanced is that they have too much to do and it is quite impossible for them to sit down and talk with one patient for an hour at a time, week after week. Impressive as it sounds, this argument is not, in fact, firmly based. It is true that establishing and maintaining a proper therapeutic relation needs much more time than prescribing a bottle of medicine. In the long run, however, it can lead in many cases to a considerable saving of time both for the doctor and for his patient (and for the National Health Service). In the Appendix two cases are quoted to prove this point.

What actually happens at present in most of the so-called psychological cases of general practice is an almost mechanical prescribing of phenobarbitone if the patient is not depressed, and of some "tonic" if he is. If this fails, various specialists are consulted, usually resulting in "reassuring" reports that nothing organically wrong has been found. Eventually a psychiatrist is also consulted, often not so much as a deliberate policy as *faute de mieux*. This situation, however, is created as much by the difficulties of the psychiatrist as by those confronting the general practitioner. It is common knowledge that the psychiatric services are pathetically unequal to the ever-increasing demand; they are flooded with patients, and consequently the psychiatrist must pick and choose. If a patient is picked he is put on the waiting-list, eventually taken on for treatment, and, more often than not, lost completely to the practitioner. If the patient is not picked the report sent to the doctor hardly ever helps him in his psychotherapeutic task except advising him to give sedatives *or* tonic.

Thrown back on his own resources, the doctor, often shamefacedly, prescribes some placebo or gives a "reassuring" pep talk. (It is a common joke to ask, "Reassuring—but to whom?") Then there are the advocates of common-sense psychology who advise the patient to have a holiday, to change his job, to pull himself together, to leave home, to get married, to have a child or not to have any more children but use some contraceptives, etc. None of these recommendations is necessarily wrong, but the fallacy behind them is the belief that an experienced doctor has acquired enough well-proved "common-sense" psychology to enable him to deal with the psychological problems of his patients. But minor surgery, for instance, does not mean that a doctor can pick up a well-proved carving-knife or a common-sense carpentry tool and perform minor operations. On the contrary, he has to observe very carefully the rules of antisepsis and asepsis, he must know in considerable detail the technique of local and general anaesthesia, and must have acquired reliable skill in using scalpel, forceps, and needle, the tools of the professional surgeon. Exactly the same is true of psychotherapy in general practice. The uses of empirical methods acquired from everyday life are as limited in professional psychotherapy as are carving-knife and screw-driver in surgery.

Experiences in Teaching Psychotherapy to General Practitioners

In the past twenty-five years or so, psychiatrists in many countries have run courses for general practitioners, courses which were often arranged because of the pressing and ever-increasing demand for them.

The results of these courses have been generally disappointing. This is a surprising outcome, for the general practitioner of some years' standing is a very good trainee. He has had time to assess the value and limitations of what he has learnt at his medical school and hospital, he has also had a fair amount of frustration and success in his practice, and he has seen enough of human suffering to make him sensitive. (Seen from this angle general practitioners are much better material for training in psychotherapy than young medical students.) The reason for the failure of these courses would appear to be that theoretical lectures, even when based on, or illustrated by, case histories or clinical demonstrations, hardly give more to the general practitioner than what he can get from reading books. Strongly influenced by the traditional medical training based on lectures and clinical demonstrations, both practitioners and psychiatrists forget, in a mutually attractive teacher–pupil relation, that psychotherapy means acquiring a new skill and not learning some more theories and facts. Nothing is easier or more satisfying for a psychiatrist than to take a patient's case and deliver a lecture about the theoretical implications, the unconscious dynamisms, and the likely diagnosis of the patient. Moreover, such teaching is gratifying indeed to both. The

specialist can shine, and the practitioner feels enriched and reassured. But this gratifying collusion is disappointing in the long run because in reality it is too facile and does not give the means of effecting therapeutic changes.

Instead of allowing this teaching-being-taught atmosphere to develop, the aim of such a course should be to help the practitioner to acquire a new skill. This means a considerable, though limited, change in the personality of the doctor. The doctor has to discover in himself an ability to listen to things in his patients that are barely said, and, in consequence, he will start listening to the same kind of language in himself. This fairly difficult change of attitude is not needed if the doctor does not have to do the listening himself, but is taught and told what other people have found out about the "human mind"—namely, the theories of psychodynamics, of personality development, of transference patterns, and so on. In the same way as a new physical skill can be learnt only in the actual situation while dealing with the problems in it, so is it with the acquisition of a psychological skill. This is why concentrated full-time courses lasting for some weeks have proved to be of very limited value. The general practitioner must use his own current experience as a basis for learning the new skill. Past experiences are unsatisfactory for this purpose, since the memory of an emotional involvement is always less alive, less vivid, than the actual experience itself.

So far, so good; but the skill to be acquired involves understanding and guiding the development of the two-person (patient–doctor) relation, and the presence of a third person would fundamentally change this situation. This condition automatically excludes the presence of the tutor. Therefore the material on which the whole training has to be based is the doctor's report of what happened in the interview situation between him and his patient. This necessary condition implies a number of uncertainties. The doctor has not yet learnt what to look for and he is somewhat self-conscious and apprehensive because of his lack of skill and understanding; like everyone else, he too is apprehensive of criticism, and, consciously or unconsciously, tries to make his activities appear in the best light and to minimize his shortcomings and mistakes. On the other hand, in order to train him, his blind spots, shortcomings, and mistakes have to be brought out quite clearly and discussed as frankly as possible. It is difficult enough to do this in any sphere of physical activity which is near to the core of the personality—say, for instance, in dancing, social behaviour, or table manners—but it is still more difficult in the psychological sphere, where the whole personality is always involved. Moreover, any such personality change needs time, and it is impossible to hurry it. The only training which systematically caters for these difficulties is the psycho-analytic training, which provides for a personal analysis lasting for many years and amounting to several hundred hours.

Experience at the Tavistock Clinic, where courses in psychotherapy for general practitioners have been given for more than twenty years, has confirmed the limited value of "teaching" psychotherapy. Consequently in the last few years a new approach has been tried—namely, to shift the emphasis from "teaching" to training, using group methods to achieve to a certain extent, although admittedly not completely, the necessary changes in personal attitudes.

At first the aim was a very modest one, amounting only to the awakening of an awareness of psychological factors, enabling the practitioners to give a better and deeper assessment of their patients' problems and illnesses. According to the doctors' reports, the result has been a great saving of their time, much less need for complicated hospital examinations (hence a considerable saving for the National Health Service), and, last but not least, some help to the patients. Admittedly all this amounted only to something of a better diagnostic skill. But, having achieved a better diagnostic skill, the practitioners then wished to know how to treat the patients. This demand was not unexpected, as, with a greater awareness of the problems, the practitioners' desire to do something to alleviate them was bound to follow. To answer this demand a two-year course in psychotherapy was organized. I now report briefly on the principles and methods used in this course. My main reason for doing so at this stage is that I believe similar courses may be contemplated elsewhere, and I felt that the approach developed may be of value to others and an exchange of ideas about the problems involved would improve the quality of the work.

Training in Psychotherapeutic Skill: (a) First Attempts

We started by advertising "introductory courses in psychotherapy for general practitioners" in the medical press, and every practitioner interested was admitted to one of the courses, each taking in, on an average, 8 to 12 doctors. Each course lasted for a term and consisted of weekly case conferences of two hours each. No systematic theory was given. The practitioners were asked from the start to describe any recent "psychological case" they had had to treat, and the discussion was kept so far as possible concrete—that is dealing with the individual problems of the patients in question. For some doctors this was enough; one or two dropped out during, and a few more at the end of, the first term. The remainder were the ones—mentioned above—who asked for more. To provide this further training, the weekly case conferences were continued, but each conference session was now followed by a tutorial meeting on the general outlines of psychodynamics, based mainly on psycho-analytic concepts. Both events took place on the same afternoon, and lasted from 2 to 5 or 5.30. This arrangement continued for two terms, and as the demand for still more training persisted it was decided to institute a two-year course.*

The method used in our training scheme was developed and tested to a fair degree jointly by Enid Balint and myself while training for the Family Discussion Bureaux a group of social case-workers who were trying to help people with marital problems. The human problems facing these workers were roughly the same as, although in some relevant points simpler than, those of the general practitioners. Some of the similarities were the starting situation—namely, a patient in trouble coming for help and a professional offering understanding, the developing patient–doctor or patient–worker relation, especially the need for controlling the doctor's or worker's subjective involvement in this relation, and so on. What was different was the usual presence of illness, often physical, in the doctor's material, and the all-important fact that the general practitioner cannot "pass the buck." Unlike general practitioners, social workers and, for that matter, specialists may say—and as is well known they often do say—this or that patient is not "my cup of tea"; "I am not interested in this kind of illness"; "I cannot find any justification for his complaints"; "the illness is so slight, or so severe, or so progressed, that it is a waste of my time to treat the man"; "give him some reassurance and ½ gr. phenobarbitone thrice daily and leave me alone"; etc. The general practitioner, come what may, *must* see his patient through, sometimes even to the bitter end; he cannot "refer him back" with an easy and empty cliché.

Before describing our scheme I wish to discuss at some length the implications for training of this factor, as its realization profoundly influenced our attitude.

(b) Practitioners and Their Relation to Specialists

The first of these implications is that the general practitioner must remain in his practice during his whole training. This rightly emphasizes the mutual roles of the psychiatrists on the one hand and the practitioners on the

*In fact, our total intake was 36 doctors. Of these, seven were irregular attenders right from the start. Of the regulars nine left after their first and a further five after their second term, leaving 15 who are doing the present two-year course.

other. Both of them are doing their jobs, neither of them is so important that for his sake the other must make sacrifices; their jobs and their roles are those of peers. A further consequence is that the general practitioner remains in full and unrestricted control of his patients, he is the one who is running the show; the psychiatrist accepts the fact that his own role is that of an expert assistant, not that of a manager, and still less of a superior mentor or teacher.

Although this approach preserves, even enhances, the practitioner's dignity, it is only with great difficulty that it can be accepted by him. One reason is the burden of responsibility, sometimes really severe, that it involves. It is so much easier to farm out responsibility, to say, "I have asked all the important specialists and none of them could say anything of importance; I really need not be better than the bigwigs." No such escape is permitted in our course. Although the opinions of specialists are asked for and listened to, they are not accepted as final or binding; they are criticized for what they are worth, and then the doctor in charge is asked to decide what is to be done with the patient and to accept undivided and unmitigated responsibility for his decision. Often the decision influences the patient's whole future. This fact too must be borne in mind.

No wonder that the practitioners, as often as not, do not like to shoulder this heavy burden. What is more surprising is the willingness of the psychiatrists (in fact of all specialists) to enter into a collusion with the general practitioner in order that this responsibility may be dissipated, if I may say so, into thin air. The patient with psychological complications is often seen by several "eminent" people, each of whom gives his opinion about one or other part of the problem, but the final responsible decision is seldom explicitly stated even if it has to be taken. If possible no decision is taken; things are left hanging until fateful events supervene and make the decision anonymously, allowing everybody to feel that after all it was not his word that counted. On the other hand, if things turn out well everybody concerned may feel that his contribution was highly important, if not the decisive one.

One feature of our scheme was to unmask this anonymity by making the practitioner accept that he is and must remain in charge of his patient. If the doctor needed more help than the course could give him he was free to refer his patient to the clinic for consultation only. The patient was then tested by a psychologist and interviewed by a psychiatrist (usually the leader of the course), but only if the doctor was willing to continue the treatment. The results of the tests and of the psychiatric interview were then brought up in our conferences and mercilessly scrutinized. The final test of their value, which kept psychologist and psychiatrist equally on their toes, was the standard question of how much help in his further treatment of the patient did the doctor get from their reports.

This is a severe test indeed, as I can testify from first-hand experience. Neither I nor the psychologists who took part in this scheme found it easy to accept that some of our reports were merely nice phrases, repeating in a different form the facts known only too well to the doctor, and giving him hardly any help in his difficult task. This sobering realization of the shortcomings of our work is only one of the many lessons that general practitioners can teach us specialists.

The "collusion" and anonymity mentioned above is an excellent way out of this often very trying self-criticism. The specialist need not see the futility of his reports, and may rest perched on his "eminent" pedestal; the doctor may grumble and feel justified in his contemptuous opinion of the useless and pretentious specialist, and no one need do anything. Our scheme, by bringing face to face as equals specialists and practitioners, has made this escape impossible. Admittedly we, as everyone else, have had cases in which very little or nothing could be done; this fact then had to be accepted explicitly and in full and open responsibility.

I have already mentioned another kind of escape, the establishment of a teaching-being-taught atmosphere. This temptation, although very attractive to both practitioners and psychiatrists, should in most cases be resisted. When listening to a case an experienced psychiatrist can almost always without any great effort make a "clever" diagnosis and even foretell with reasonable accuracy what will happen in the doctor–patient relation for the next period. If he indulges in such a "conjuring trick" he severely interferes with the doctor–patient relation and inhibits the doctor's powers of observation and ease of handling the case. The doctor will then try either to confirm the psychiatrist's prophecy or to prove it to be incorrect, according to the actual relation between them. In any case the individual doctor and the group are deprived of the opportunity of finding out for themselves the advantages or disadvantages of one or the other ways of handling the problem.

(c) Present Training Scheme

The weekly case conferences are the mainstay of our scheme. About 10–12 are held in each of the three terms. To secure intensive participation and, on the other hand, to obtain varied enough material, we found it advisable to have groups of six to eight doctors. In addition to the conferences we offer to any doctor who asks for it individual supervision of his cases—that is, about an hour a week of "private" discussion. While the conferences are taken by the leader of the course, the individual supervision is provided—aided by some external help—by other clinic consultants. Psychotherapeutic technique is highly individual. In order to avoid the danger of muddling the practitioner by the often widely diverging views and approaches of the various consultants, the supervisors were asked to attend some of the case conferences before taking on any doctor for supervision. It was explicitly stated that they were not expected to subordinate their individual views to those of the course leader; on the contrary, they were asked to take part in the case discussions as frankly as they wanted. The reason for their attendance was that they should acquaint themselves with the atmosphere of the conferences, and, on the other hand, that the doctors should have the opportunity of finding out who they would like to supervise their cases. As these supervisions are expected to run on well-known lines, I wish to restrict my report to the psychodynamics of the case conferences.

I have already pointed out that we try to avoid so far as possible the ever-tempting teaching-being-taught atmosphere. Our aim is to help the doctors to become more sensitive to what is going on, consciously or unconsciously, in the patient's mind when doctor and patient are together. This kind of listening is very different from "history-taking," and here we encountered much difficulty when trying to free the doctors from the automatic use of this kind of approach. The main difference is that history-taking is concerned almost exclusively with objective events or with events that can easily be expressed in words—that is, events towards which both doctor and patient can adopt a detached "scientifically objective" attitude. The events that are our concern are highly subjective and personal, often hardly conscious or even wholly beyond conscious control; also, as often as not, there exists no unequivocal way of describing them in words. Nevertheless these events exist, and, moreover, they profoundly influence one's attitude to life in general and still more so to falling and being ill, accepting medical help, etc.

"Automatic Patterns"

It may safely be said that these events, happening all the time in everybody's mind, are only partly sensible adaptations to the ever-changing environment; to a large extent they are governed by almost automatic patterns originating mainly in childhood but influenced by emotional experiences in later life. The first task for our scheme was to awaken in the doctors an awareness of these automatic patterns, and then to enable them to study more and more in detail how these patterns influence the patient's attitude towards his

own illness, and, on the other hand, how they colour or even determine his relations to any human being, and especially to his doctor.

Another factor affecting the patient's developing relation to his doctor is the doctor's response, which also is partly governed by automatic patterns. The interplay of these two sets of patterns, whether and how they "click" with each other, determines to a large extent the efficiency of any treatment. Its influence is less important in short-lived acute illnesses, but almost crucial in chronic ones. In order to achieve a better fit, and with more patients, the doctor must have a wide choice of responses, which means that he must become aware of his own automatic patterns and gradually acquire at least a modicum of freedom from them.

What is Needed

Intellectual teaching, however good and erudite, has hardly any effect on this process of liberation and general easing up. What is needed is an emotionally free and friendly atmosphere in which one can face the experience that quite often one's actual behaviour is entirely different from what has been intended and from what one has always believed it to be. The realization of this discrepancy between one's actual behaviour and one's intentions and beliefs is not an easy task. But if there is good cohesion between the doctors in the group, the mistakes, blind spots, and limitations of any individual member can be brought into the open and at least partially accepted by him. The group steadily develops a better understanding of its own problems, both collectively and individually. The individual can more easily face the realization of his mistakes when he feels that the group understands them and can identify with him in them, and when he can see that he is not the only one to make mistakes of this kind. Moreover, it takes only a very short time for the group to discover that the technique of each member, including the psychiatrist group leader, is an expression of his personality, and so, of course, are his habitual mistakes.

Admittedly crises occur from time to time, when one or other member finds it difficult to accept the full implications of some of his ways of handling his patients, or the realization of some facets of his personality that he had been only dimly aware of. These, however, can be borne, as they are also group events and do not solely concern the individual. It has been easy to describe this state of affairs, but it is rather difficult to explain its dynamism. So long as the mutual identifications of the members are fairly strong, any individual member can face strains because he feels accepted and supported by the group. His mistakes and failings, although humiliating, are not felt as singling him out as a useless member; quite on the contrary, he feels that he has helped the group to progress, using his failings as stepping-stones.* Crises may occur when there is some tension between one or the other member and the rest of the group which the leader has not detected soon enough (I would add that neither his role nor his psychiatric training confers on the group leader an absolute immunity against this hazard), and, instead of re-establishing good cohesion, his criticism may help to widen the gulf.

Signs of this isolation or tendency to isolation and the accompanying touchiness can be regarded as the equivalents of what psycho-analysis calls resistances. On the one hand, they are premonitory signs that some major personal attitude of the individual is being tackled in the group situation; on the other hand, by the way in which the isolation is achieved and maintained, they show what the problem is. In the same way the reaction of the integrated group towards such an attempt at isolation reveals the other side—that is, the counter-transferences of the group to the particular personality problem. The way in which a member isolates himself, as well as the way in which the group deals with it, must be shown up. They represent very valuable material for studying interpersonal relations, and their full realization is a necessary condition to the re-establishment of a workable cohesion.

If such crises occur too often, or leave a bitter resentment behind, it is a sign that the pace of training has been too exacting and that the group has been made to work under considerable strain for some time. It is an equally ominous sign, however, if no crises occur at all; it means that the sensitivity and grasp of the group are not developing, the group and its leader are in real danger of degenerating into a mutual admiration society where everything is fine and we are nice, clever, and sensible people. It is a fact that acquiring psychotherapeutic skill is tantamount to discovering some hard and not very pleasant facts about one's own limitations. This unpleasant strain must be faced, and the group develops as long as it can face up to it, and stops developing as soon as it tries to avoid it. It is the task of the group leader to create an atmosphere in which each member (including the leader) will be able to bear the brunt when it is his turn to bear it.

It is a precondition of our technique to establish this kind of atmosphere in the group, and it is only in such an atmosphere that it is possible to achieve what we term "the courage of one's own stupidity." This means that the doctor feels free to be himself with his patient—that is, to use all his past experiences and present skills without much inhibition. At the same time he is prepared to face severe objections by the group and occasionally even very searching criticism of what we call his "stupidity." Although every report and case conference is definitely a strain and an effort, the result is almost always a widening of one's individual possibilities and a better grasp of the problems.

Importance of Timing

One of the most important factors in this kind of training is timing, which in the first approach means not to be in a hurry. It is better to allow the doctor to make his mistakes, perhaps even to encourage him in this, than to try to prevent them. This sounds rather foolhardy, but it is not; all our trainees have had considerable clinical experience, and this "sink or swim" policy was justifiable. Apart from not undermining the confidence and dignity of the doctor, it has the added advantage of providing ample material for discussion, since everybody was seeing patients all the time and was anxious to report his findings and discoveries, his successes and difficulties. As I have confessed, this policy may have been too much for some doctors, and we had a fair number of "casualties" who did not wish to continue.

If the timing is good enough, the doctor feels free to be himself and will have "the courage of his own stupidity." Gradually he becomes aware of the type of situation in which he is likely to lose his sensitivity and ease of response, or, in other words, to behave automatically. Meanwhile the reports of the other doctors have shown him what other ways might be adopted in similar situations. The discussion of the various individual ways, demonstrating their advantages and limitations, encourages him to experiment. (One practitioner announced the result of such an experiment thus: "I have done a real 'Smith' in this case—and it worked," meaning he had adopted the attitude he felt Smith usually adopted.) Every such experiment means a step towards greater freedom and better skill.

Attitude of the Group Leader

Perhaps the most important factor is the behaviour of the leader in the group. It is hardly an exaggeration to say that if he finds the right attitude he will teach more by his example than by everything else taken together. After all, the technique we advocate is based on exactly the same sort of listening that we expect the doctors to acquire. By allowing everybody to be themselves, to have their say in their own way and in their own time, by watching for proper cues—that is, speaking only when something is *really* ex-

*In psychiatric terms, the depression caused by the realization of one's shortcomings must be fully accepted; identification with the common group ideal must remain, now as before, a desirable and attainable aim, but the group leader must watch very carefully when and how one or the other member is forced or allowed to slide into a paranoid position of the one who has been "singled out."

pected from him and making his point in a form which, instead of prescribing *the* right way, opens up possibilities for the doctors to discover by themselves *some* right way of dealing with the patient's problems, the leader can demonstrate in the "here and now" situation what he wants to teach.

Obviously no one can live up to these exacting standards without some shortcomings. Fortunately there is no need for perfection. The group leader may make mistakes—in fact, he does quite often—without causing much harm if he can accept criticism on the same, or even somewhat sharper, terms as he expects his group to accept. This must be watched very carefully, and any hesitation by the group in exposing the leader's mistakes must be pointed out. Obviously this freedom cannot develop if the leader tries to hedge or to explain away his failings. It is a very wholesome sign if the group can run the leader down, even if they have some fun at his expense, if only they can do so without rejecting him or turning hostile to him. (Incidentally, this frank criticism is another way in which practitioners can teach us specialists.)

The Training Technique

One more word about the number of doctors who dropped out. The technique described here is still in its experimental stages—that is, it is crude and harsh. We are fully aware of this and we have decided to accept the risks involved. Our first consideration has been to develop a technique that is workable for a fair enough proportion of the doctors interested, in order to test out whether such a training technique is possible at all. The results of the two pilot projects —the Family Discussion Bureaux scheme for social workers and the Tavistock Clinic scheme for general practitioners —are highly encouraging, although as yet not final. As soon as our technique is fairly securely settled, our next concern will be to examine our "casualties"—that is, the reasons why so many of our entrants have to leave us. It is true that psychotherapy in the same way as, for instance, surgery, is not within everybody's reach; nevertheless our "casualty rate" is too high. Conversely, this means that our training technique is, for the time being, inelastic and too exacting for a great number of practitioners.

There is, however, one very important difference between this kind of training and any other training in one or other of the many specialties in medicine. Any advance in therapy demands a new skill from the doctor, even if it amounts only to learning the correct ways of prescribing a new drug. In other words, mastering a new therapy means a change. But, whereas the changes required by new techniques in any of the other branches of medicine do not touch much upon the doctor's personality, the technique of psychotherapy involves the personality fairly deeply. From this angle the action of some doctors who dropped out is perhaps a sensible defence against an unauthorized violation of their private mental life, a defence that must be treated with respect. The diametrically opposite danger is that the group training may degenerate into therapy pure and simple. We are fully aware of this possible complication, which, in fact, is present in every form of psychiatric training, but as our scheme is a very young one we have not had to come up against it.

Summary

A training scheme in psychotherapy is described, in which the emphasis has been put on acquiring a personal skill instead of on teaching. The aim is to make the general practitioners aware of what their patient wants to convey to them, not so much by his words as by his whole behaviour, and of how their own general behaviour and actual responses influence what the patient can actually tell them. We have tried *not* to teach them what psycho-analytic or any other theory could say about the working of the human mind; instead we have aimed at enabling them to be free enough to feel and understand what is going on between the patient and themselves in their surgery.

APPENDIX

It is generally recognized that it is rather difficult to describe in a condensed and concise form the subtle work of psychotherapy in any given case. That is the reason why only two case histories are given here as illustrations. The first describes the events and the consequences of what we called "the collusion of anonymity" between the general practitioner and his consultants. The second case tries to give an impression of the stage to which psychotherapeutic skill and understanding of our course have developed. When judging the case history, the reader must bear in mind that the work reported here was done in the third month of a course which is planned to last two years. Both case histories were compiled by the doctor treating the patients. Since, according to our idea, the doctor's personality plays also an important part in every therapy, I start each case with a short characterization of the doctor in charge.

Case 1

The doctor attending this case works in a partnership. His partner is a straightforward practitioner who wants to get on with the job. The reporter, however, is interested in the psychological implications of the illnesses and has a fair knowledge of the current psychiatric ideas. He reports:

"A married childless woman aged 32 has been on my partner's list since 1946. She complained then of epigastric and chest pains. In April, 1946, my partner sent her for investigation to an eminent physician, who reported: 'You will be glad to hear that this patient's chest *x*-ray film is quite normal. She seems very pleased at this, and I think most of her symptoms are functional, and I hope that the reassurance that I have given her may be of some help.' A short while after this the patient was unhappy about the condition of the chest, as the pain returned, and she was sent for *x*-ray examination to a chest clinic. The physician to the chest clinic reported in May, 1946: 'You will be pleased to learn that there is no evidence of pulmonary or pleural tuberculosis. I think the epigastric pain originates in the abdominal wall—that is, it is probably muscular or fibrous in origin. Massage might now be tried.' Massage was accordingly tried, but with little success.

"She was a frequent visitor to the surgery, and was seen by me first in October, 1946. I thought then that her symptoms might be due to 'chronic appendicitis.' I referred her to a gynaecologist first, who wrote in 1947: 'This lady is rather puzzling. She has been under Dr. L., who had her completely investigated and found nothing; I must admit I can find nothing abnormal, and from the gynaecological point of view I have drawn a blank. Whether in view of her constant pain in the right side and her chronic constipation there is the possibility of appendix trouble, it is difficult to say, but if you wish I will ask one of the surgeons, etc.' A surgeon was accordingly asked, and he said, in October, 1947: '. . . I have advised her to come into hospital for the removal of the appendix.' Appendicectomy was carried out in December, 1947. She came to see me practically every week with a variety of pains, sometimes in the right iliac fossa, sometimes in the back, and drove me frantic with seemingly irrelevant chatter and unwillingness to leave me during a busy surgery. I sent her to see a well-known orthopaedic surgeon on account of her persistent backache. He said in January, 1948: 'She has a supple back, although there is some slight tenderness in her lumbar muscles. I am arranging for her to have some treatment in the physiotherapy department.'

"She attended my surgery every week regularly, had still the same complaints as before, and began, to my puzzlement, to be rather aggressively flirtatious with me. I then told her one day, rather abruptly, that there was little more I could do for her and that it would be best if she went back to her job as a sales assistant and not come back to see me for some time. I did not see her again until 1950. She came then with her old complaints of pains again and in the attitude of a penitent child ('Didn't you miss me,' and 'I hope you won't be cross with me any more'). She still came every week, again became flirtatious and tried to put her foot on mine, and one day put her hand on mine. I

rebuked her, and she cried. She came back the following week and in subsequent weeks, receiving five to ten minutes' chat and a bottle of medicine on each occasion.

"Since then, owing to a greater awareness of personality disorders on my part, she has been given a one-hour interview in which, *inter alia*, she told of her childhood, of a father who was in the Navy and away from home most of the time, of a much-loved younger brother who died at the time of the onset of her symptoms, of her dyspareunia since the beginning of her marriage, and her complete inability to have sexual intercourse since her brother's death. Further investigations are in progress. Her attitude to me since that interview has much changed; there are no more efforts to flirt and there is an improvement in her symptoms. But it took four years to get that hour, and an appendicectomy. *Mea culpa!*"

Case 2

The doctor in charge of this case is a well-experienced and rather cautious general practitioner. Although he seemed to be sincerely interested in his patients' psychological problems he was careful, until coming to the course, not to get too much involved with them. He attended for three terms, hardly missed a conference, and, although following the discussions with great interest, even to quoting his own experiences, never tried any real psychotherapy with his patients. Then suddenly he decided to start with one case, and on the same day the case of which the following is his report occurred in his practice. It was this case which he started reporting with the phrase, "I did a real Smith—and it worked."

"The patient, a boiler coverer, aged 26, was a quiet, thin, pale, neat, inoffensive young fellow. Married three weeks before. Severe headaches. No relief in tab. codein. Pain 'behind eyes'; feels 'something wrong with brain.' Cannot go to sleep, and wife has to sit with him and hold his hand. Worries about 'floods.' For the last two months he could not go to the cinema; he gets lost in the film and suddenly 'comes to,' gets a 'crowded-in feeling,' feels panicky, screen seems to recede, and he has to rush out of the cinema. He also fears boilers now and is jumpy when working on them. He has always found it hard to make friends and is content to be by himself.

"No sex life before marriage. Satisfactory now for him, but wife has to be manually masturbated to achieve orgasm. ('I feel funny telling you that.') Feels content sitting in in-laws' house now, in spite of noise of numerous children, but is not so happy about going out. His wife has recently recovered from pulmonary tuberculosis and is at work again. The patient is very 'fussy'; does all the housework himself because he likes to do it, not of necessity. Gets a 'kick' out of giving his wife breakfast in bed.

"*Family History.*—Mother died when he was 3 years old, and he and his two elder brothers were sent to an orphanage, where he stayed until 14. Father had tabes and was blind. When the patient left the orphanage he became the maid-of-all-work at home. It was he who did the shopping and cooking and cleaning. He led his father about all the time, not his brothers. (This I remember very well, as I used to treat his father and knew the family set-up well.) His only hobby was motor-cycling, and he always took his father out on the motor-cycle. He thinks his father's blindness was due to war injuries and experiences. He himself often wondered what it was like to be blind, and often did a 'silly thing'—drove his motor-cycle blind to see what it felt like. His father's mother was blind (he was told) and she was also the youngest in her family.

"He dislikes his elder brother intensely and the dislike is reciprocated. This brother always acted the big boss: he expected to be waited on, 'took everything for granted,' and expected the patient to wait on him like a slave. The brother does not drink nor smoke, and is a highly critical sort of chap. He even supervised the patient's courtship, told him when he should get home at night, and strongly advised him against marriage. The brother's marriage broke up after three weeks and was 'annulled' (that was the word he had heard used.) The patient was afraid of him, but now they are not on speaking terms and pass each other in the street.

"Two weeks ago the patient was admitted to hospital for investigation because of the severity of the headaches: He was discharged after a few days, being told it was his 'nerves.'

"*Hospital Notes* (seen by me).—'Came to hospital in taxi as he could not walk owing to severity of headaches. Admitted: ? sinusitis; ? migraine. Investigated, and no organic cause found. C.N.S. clear. Discharged. To be seen again next week. ? Psychiatrist.'

"March 13, 1953.—He reported to me immediately after he left hospital, complaining that headaches were still persistent and that he could not get to sleep. 'I don't know why I should be like this; after all, it is the first time in my life I have been free from financial worry—for example, paying off motor-cycle—and wife is over her T.B. and is working. Thus I can have little luxuries I could not afford before.'

"*Immediate Interpretation After Taking History.**—Assured not organic and nothing to do with father's blindness. 'You have always been pushed around since childhood and always in an inferior position. The Cinderella of the family. You had no right to be all right. You always had to carry a burden and had no right to affection (which you really craved). Now you are suddenly free of your tasks (through which you were playing out your inferior position) and you are immediately obsessed with guilt. So you have to atone with a symptom—the obvious one being headache—behind eyes—associating yourself with your father, to whom you were attached (and perhaps unconsciously resented).' 'I thought of that myself.'

"March 16.—Saw the patient again. He said he felt 'marvellous.' No headaches; knows it is not organic now and understands symptoms are due to his previous life; sleeps through the night and goes off to sleep immediately; not frightened in a crowd, and is very grateful.

"May 7.—The patient has been back at work since March, is very happy with his wife, sleeps well, and has no complaints at all."

Postscript when reading the proofs.—Report of the practitioner on October 22: "Man not seen for several months, only wife, who reported that he was fine. He occasionally gets headaches, which do not amount to anything, and he continues working. He is much easier to live with, and from the point of view of the wife he is a complete cure."

*This interpretation was what the doctor described as: "I did a real Smith."

MYELOMATA OF BONE

A REVIEW OF 25 CASES

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Myelomata are said to be the rarest form of bone tumour (Geschickter and Copeland, 1936; Cade *et al.*, 1947), yet of 25 cases here reported 24 have been treated in this hospital group over the past five years, and one of us (A. N.) has had nine under his care in the past two years. During this same five-year period 13 cases of osteogenic sarcomata of bone (including three cases arising in Paget's disease) have been treated in the Bradford Regional Radium Institute. Osteogenic sarcoma is given considerable prominence in medical textbooks, yet it is apparent that its incidence is less than that of myelomata of bone. We suspect the incidence of the latter is not so uncommon as is usually suggested, and believe that many cases are wrongly diagnosed as secondary carcinomata or never diagnosed. Four cases in this series were diagnosed only when the patient was admitted *in extremis*. One is apt to associate myelomata with the textbook picture of multiple discrete osteolytic lesions in the skull, clavicle, vertebrae, and ribs, but this is usually the terminal picture. Hence one finds that most cases have a history lasting one to two years before the diagnosis is made. Early diagnosis is difficult because the condition is often asymptomatic for a long period, while signs and bio-

chemical changes are very variable and not all are present in an established case. We wish to emphasize that one or more negative investigations do not exclude the condition, and the whole gamut of confirmatory tests is required before we can be confident of its absence.

While textbook descriptions stress the multiplicity of the lesions, and this is no doubt the commonest type, solitary and diffuse forms of the condition are encountered. The tumours are soft, reddish purple in colour, and vascular, although central necrosis may be present in large tumours (Case 4). They consist of ovoid or pyriform cells with a nucleus which has a nucleolus and a typical "clock" or cartwheel appearance due to dense chromatin.

We find the disease to exist in three forms: (1) a solitary form in which a large tumour is present; (2) a diffuse form in which the lesions are small and cause a diffuse decalcification of the affected bone; and (3) a multiple form into which the others usually develop when the plasma cells are aggregated into discrete nodules forming localized osteolytic lesions.

Myelomata Initially Solitary

Willis (1941) enunciated the criteria which determine the diagnosis of solitary myeloma—histological diagnosis, radiographs of the entire skeleton at regular intervals, and the absence of Bence Jones proteose from the urine. Only 23 cases of proved solitary myeloma have been described (Lumb, 1952). Many described as such have subsequently become multiple. The solitary tumours are large and affect the long bones and spine (Chesterman, 1935; Willis, 1941) as opposed to the affection of the flat bones and ribs by the multiple form.

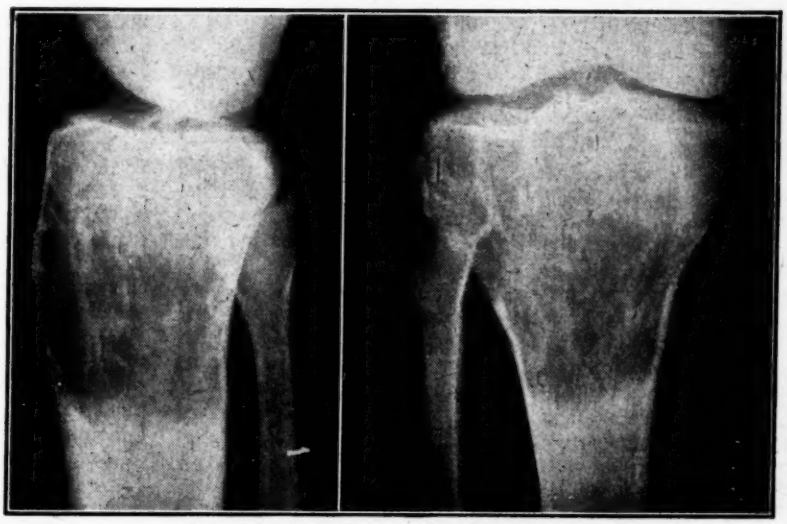
There is little doubt that many myelomata are solitary initially, but the picture of multiple myelomata usually develops. It is therefore probable that this form and those which appear to be initially multiple are a single pathological entity, the rate of metastasis being extremely rapid in the multiple form, which is the end-stage of the disease. Some pathologists, however, maintain that multiple myelomatosis is a multifocal systemic disease without metastasis (Lumb and Prosser, 1938) and that the solitary myeloma is a separate entity. This view is difficult to reconcile with our experience and the other recorded cases of solitary tumours which ultimately disseminate (Cutler, Busch, and Cantril, 1936).

Case 1.—In November, 1944, a man aged 36 fell on to his sacrum. In July, 1945, he developed severe pain in the lumbo-sacral region and both legs. *X*-ray examination revealed the presence of a multilocular cystic tumour involving the entire sacrum. The sacrum was expanded and the cortex eroded anteriorly. Trabeculation was present. Biopsy on July 21 showed typical plasmocytoma. The blood picture was normal. Deep *x*-ray therapy was given. He remained well and there were no deposits in the ribs until July, 1951. Sternal puncture then showed myelomatosis to be present. In August he was given a course of stilbamidine and deep *x*-ray therapy, which relieved his pain a little. The patient is still alive, but is confined to bed owing to his rapidly deteriorating condition. *Comment:* This tumour remained solitary for seven years, but ultimately the typical multiple form developed.

Case 2.—A woman aged 63 was first seen in 1947. She complained of pain in the right loin for two years and had recently noticed a lump in this situation. An *x*-ray film showed rarefaction of the twelfth rib. Kahn test negative. Tumour excised—section showed a tumour of undifferentiated round cells and no definite pathological diagnosis made. Two years later she had a similar mass over the left sixth rib. Bence Jones protein absent from urine. Mass excised but no definite pathological diagnosis made. On March 30, 1950, a further mass was removed from a rib which proved on section to be a myeloma. The patient died one year later.

Case 3.—In May, 1948, a man aged 41 fell from a ladder and attended hospital. *X*-ray film revealed solitary cyst in the upper end of the femur. The other long bones, ribs, and skull were not examined radiologically. Biopsy revealed the presence of a plasmocytoma. Deep *x*-ray therapy was given. In August he was readmitted and died within twelve days. *X*-ray examination revealed punctate osteolyte lesions in ribs, skull, and pelvis. Urine: Bence Jones protein and albumin present. Blood: Hb, 55%; W.B.C., 6,000; moderate rouleaux formation; total protein, 12.8 g.% (albumin 3.0 g., globulin 9.8 g.); A/G ratio, 1 : 3.27. Necropsy confirmed the diagnosis of multiple myeloma.

Case 4.—This case represents the closest approach to the solitary plasmocytoma in this series. The patient, a man aged 28, was seen on February 21, 1952. The first symptom was pain below the knee, present for the previous nine weeks. It was worse when he walked. Examination revealed tenderness over the tibial condyle, no effusion in knee, and full knee movements. An *x*-ray film showed a multilocular cyst in the upper end of the tibia extending down the shaft, but not expanding the cortex. On later review two small translucent areas could be seen below the main cyst (Figs. 1 and 2). Films of the skull, ribs, and long bones showed no other tumour. Urine: Bence Jones protein absent. Biopsy: typical plasmocytoma—central necrosis of the tumour present at operation; Unna–Pappenheim staining showed typical plasma cells. Sternal puncture, normal. Blood: acid phosphatase, 1.3 units; alkaline phosphatase, 4.3 units; total plasma protein, 6.8 g.% (albumin 3.8 g., globulin 2.8 g.); A/G ratio, 1.5:1. An *x*-ray film four weeks later showed two small translucent areas in the skull. Deep *x*-ray therapy was given. The symptoms cleared and he walked without pain or limp. The tumour has not enlarged and no further changes have occurred in other bones. Plasma protein is still unchanged. *Comment:* This case would appear to resemble that described by Chesterman, but the two nodules in the skull suggest that multiple lesions will appear at some future date.



FIGS. 1 and 2.—Case 4. Myeloma of tibia.

In the cases described above, Bence Jones protein was absent in two, and present in one when multiple lesions had appeared. It is probable that changes in plasma globulin and A/G ratio are late changes and present only when there are multiple deposits.

Multiple Myeloma

The established multiple myelomatosis may appear in circumscribed or diffuse forms, and again the latter may develop into the former. The picture of the circumscribed variety is that which we have been apt to assume from our textbooks as the only type, but the well-established picture of multiple osteolytic lesions in the skull, pelvis, scapulae, ribs, and other bones appears to be a late stage in the disease. Unfortunately diagnosis before this stage is reached is not always possible, as many diagnostic features may be absent; and, as there is often a paucity of symptoms, or none, its presence is often unsuspected. The presenting symptoms are variable, but localized pain, especially persistent backache, was a feature in many, and paraplegia was present in two of our cases. It is possible that the discrete punctate form is preceded by a diffuse form producing general decalcification. Then discrete nodules produce osteolytic areas.

Case 5.—Man aged 56. Presenting symptoms and signs: ascites and ulceration of mouth. Diagnosis: cardiac failure and thrombosis. Ultimately diagnosed as multiple myeloma. Died without treatment. Blood picture: Hb, 47%; E.S.R., 83 mm.; W.B.C., 8,600; marked rouleaux formation present. Sternal puncture, plasma-cell myelomatosis. Blood urea, 40 mg. per 100 ml. Total protein, 11.5 g.% (albumin 1.9 g., globulin 9.6 g.); A/G ratio 1 : 5. *X*-ray films showed multiple punctate osteolyte areas in skull, ribs, and pelvis. Urine: Bence Jones protein absent.

Case 6.—Man aged 42. Presenting symptoms: proptosis and headaches. *X*-ray films revealed multiple punctate areas of erosion in the skull. No changes in ribs and other bones. Blood protein and A/G ratio unchanged initially, but after two months the total protein was raised and the A/G ratio became 1:3.8. Course of stilbamidine given. Died four months later. *Note:* Normal proteins initially.

Case 7.—Woman aged 64. Presenting symptoms: lassitude and dyspnoea for six weeks. Died within two weeks of attendance at hospital. Sternal puncture positive for myeloma. *X*-ray films showed punctate areas in ribs and skull. Plasma-protein estimations and presence or absence of Bence Jones protein not recorded.

Case 8.—Woman aged 58. Presenting symptoms: nausea and cough for six weeks. Died two weeks after hospital admission. *X*-ray films showed multiple punctate areas of erosion in ribs, skull, and pelvis. Blood picture: Hb, 80%; W.B.C., 10,000; urea, 120 mg. per 100 ml.; protein not estimated.

Case 9.—A man aged 53 had backache for four months and then developed weakness and paraesthesia in one leg after three months. Paraplegia developed and he was admitted. Examination showed paraplegia due to lesions at level of D 8. *X*-ray films showed osteolytic lesions in ribs and skull, with compression of D 7 vertebral body. Disk spaces intact. Blood: protein 7.4 g.%, A/G ratio normal; acid phosphatase 1.5 units. Urine: Bence Jones protein absent. Deep *x*-ray therapy and stilbamidine given. Readmitted eight months later; no change in paraplegia; deposits in shoulder girdle and cervical spine. Died 13 months after first attendance.

Case 10.—Man aged 58. December 8, 1950:—presenting symptoms: cough for six weeks and tumour of angle of mandible extending to ramus. *X*-ray film showed obstruction of angle of mandible with erosion of ramus. December 14:—biopsy: typical plasma-cell myeloma. January 15, 1951: *x*-ray film showed erosion of first rib. February: course of deep *x*-ray therapy given—3,000 r to mandible and shoulders. May 9: *x*-ray films showed defect in upper end of femur; no destructive lesion in spine. Incontinence of urine. Suprapubic cystotomy performed. Test for Bence Jones protein not performed. Further deep *x*-ray therapy and nitrogen mustard given without effect. Patient died on July 27, 1952.

Case 11.—Woman aged 64, referred from radiotherapy department May, 1949, with ? osteoclastoma of sternum. Presenting symptoms: backache, pain in chest and arms for six months. *X*-ray film showed loculated tumour in manubrium sterni. No other radiographs of bones taken. Deep *x*-ray therapy given. In November, 1949, pain had been relieved but tumour unchanged. *X*-ray examination showed translucent areas in several ribs and right clavicle. Urine: Bence Jones proteose present. E.S.R. 47 mm. Total plasma protein, 6.6 g.% (albumin 2.9 g., fibrinogen 0.17 g., globulin 2.9 g.); A/G ratio 1 : 1. Course of nitrogen mustard therapy given in January, 1950. In July, 1950, *x*-ray examination showed no further changes. Patient died September, 1951; own doctor stated cause to be "coronary thrombosis due to hyperpiesis."

Case 12.—Man aged 68. Presenting symptoms: breathlessness, diplopia, and numbness of face for three weeks. *X*-ray film of skull showed punctate areas typical of myelomatosis. No lesion in pelvis. Total protein, 7.5 g.% (albumin 5.7 g., globulin 1.8 g.); A/G ratio, 3.1 : 1. Alkaline phosphatase, 4.4 units; acid phosphatase, 0.9 unit; blood urea, 210 mg. per 100 ml.; E.S.R., 13 mm.; W.B.C., 12,000; Hb, 90%. Urine: Bence Jones proteose absent. Sternal puncture: typical of myelomatosis. Died two weeks after initial observation.

Case 13.—Woman aged 47. Presenting symptoms: feeling of weakness for many years, backache for six months, exophthalmos. Blood: cholesterol, 250 mg. per 100 ml.; total protein 7.9 g.% (albumin 6.2 g., globulin 1.7 g.); A/G ratio, 3.6 : 1; Hb, 90%. Sternal puncture: normal. Urine: Bence Jones proteose absent. *X*-ray film of skull: punctate areas typical of myelomatosis; no lesion in other bones.

Case 14.—Woman aged 64. May 12, 1952:—presenting symptoms: pain in right lower ribs. Blood: Hb, 48%; R.B.C., 2,900,000; W.B.C., 4,400; total protein, 11.0 g.% (albumin 5.1 g., globulin 5.5 g.); A/G ratio, 1 : 1. Urine: Bence Jones proteose present. *X*-ray films showed multiple destructive lesions in ribs and skull, with generalized decalcification. Stilbamidine and deep *x*-ray therapy given. Last seen July 30, 1953. Pain then considerably relieved.

Case 15.—Man aged 71. July 30, 1952:—presenting symptoms: repeated epistaxis and melaena. *X*-ray films showed multiple small areas of translucence in skull, right humerus, and right femur. Blood: total protein, 7.95 g.% (albumin 2.65 g., globulin 5.3 g.); A/G ratio, 1 : 2. Course of deep *x*-ray therapy given.

Case 16.—Woman aged 59. Presenting symptoms: low back pain for eighteen months, unrelieved by bed rest or plaster immobilization. *X*-ray films showed general decalcification of lumbar and dorsal spine and pelvis. Blood: total proteins, 8.0 g.% (albumin 3.9 g., globulin 3.8 g.); A/G ratio, 1 : 1; calcium, 10 mg. per 100 ml.; phosphorus, 3.2 mg. per 100 ml.; Hb, 68%; W.B.C., 9,000. Some months later *x*-ray films showed typical punctate areas in ribs, pelvis, and skull. Sternal puncture: typical myelomatosis. Urine: Bence Jones proteose absent. Deep *x*-ray therapy relieved pain. Died three months after treatment. *Comment:* This case demonstrates the diffuse decalcification, followed by the appearance of the typical multiple osteolytic lesions.

Case 17.—Woman aged 60, seen in 1950. Presenting symptoms: pain in dorsal region for about three months. Had kyphosis and tenderness at D 9–10. *X*-ray films showed collapse of D 9; no lesions in ribs. Thought to have secondary carcinoma, but no primary lesion found. Six months later *x*-ray examination showed no further radiological changes; no lesions in ribs or humerus. Twelve months later, *x*-ray films showed punctate areas in dorsal and lumbar spine, skull, and long bones. Sternal puncture: typical myelomatosis. Urine: Bence Jones proteose

present. Blood: total protein, 6.0 g.% (albumin 5.2 g., globulin 0.8 g.); A/G ratio 6.5 : 1. The patient is still alive. Has had a course of stilbamidine without demonstrable effect. No deep *x*-ray therapy given. Note normal serum proteins when all other typical changes were present.

Case 18.—Woman aged 56. Admitted February 18, 1953, with fractured shaft of right femur. There had been pain in the knee for the two previous months. *X*-ray films showed a fracture through a large cyst at junction of lower and middle thirds of femur. *X*-ray films of ribs, clavicle, scapula, and skull showed multiple osteolytic areas with no new bone formation. Uroselectan showed normal renal function. Urine: no Bence Jones proteose present on repeated testing. Blood: W.R. negative; blood urea, 27 mg. per 100 ml.; total protein, 5.7 g.% (albumin 2.97 g., globulin 2.4 g.); A/G ratio, 1.2 : 1 (same when repeated after three weeks). E.S.R., 45 mm. per hour. R.B.C., 3,800,000; W.B.C., 10,000; Hb, 69%. Sternal puncture: positive for myelomatosis. Biopsy of nodule in left acromion process showed plasma-cell myeloma.

Case 19.—Woman aged 66. Admitted with history of increasing shortness of breath and weakness for a year. Doctor had noted that she was anaemic six months previously, and started some liver injections with no improvement. Three months previously she developed severe backache, which was aggravated by any attempt at movement, and was admitted in this condition. Had vague aching in most joints. No marked physical features. Bence Jones proteose—positive. Total serum protein, 7.2 g.% (albumin 3.4 g., globulin 3.8 g.); A/G ratio, 1 : 1.1. Blood urea, 40 mg. per 100 ml. *X*-ray film showed no change in skull. Some compression of D 5, 6, and 7, with decalcification. Generalized osteoporosis of dorsal and lumbar spine. Osteolytic areas in ribs and sternum. Sternal marrow puncture: 90% of cells were plasma cells. Blood count: Hb, 22%; leucocytes, 3,800.

Case 20.—Woman aged 69. Presenting symptoms: shortness of breath and feeling of tiredness for six months. Physical examination showed no definite features. *X*-ray films of skull, femora, and pelvis showed bone detail within normal limits. Old fracture of right clavicle and left eighth rib. Area of rarefaction in left clavicle. Sternal puncture: numerous lymphoid cells and abnormal early cells; ? localized deposit of leukaemia. Bence Jones proteose—negative; trace of albumin in urine. Blood: total plasma protein, 9.3 g.% (albumin 1.3 g., globulin 7.7 g.); A/G ratio, 1 : 5.9; Hb, 48%; leucocytes, 7,300 (lymphocytes 2,701; polymorphs 2,236; myelocytes, 1,633). The patient died two months after admission. Necropsy: skull normal; sternum filled with whitish nodules; vertebrae contained similar white areas of marrow in lumbar region and upper end of femur. Sections taken showed myeloma, although cells resemble lymphocytes.

Case 21.—Woman aged 56. Presenting signs: pain in neck, radiating into occiput and to left shoulder and left clavicle. Developed stiff shoulder, which was treated and which has improved; but she still has some pain in the neck. Has noticed prominence of inner end of clavicle. *X*-ray film showed soap-bubble rarefaction of inner end of clavicle. Biopsy showed myeloma cells. Sternal puncture: myelomata; many atypical plasma cells. Bence Jones proteose—negative; trace of albumin in urine. Blood: total plasma protein, 10.1 g.% (albumin 3.1 g., globulin 6.58 g.); A/G ratio, 1 : 2.1. *X*-ray film shows small area of rarefaction in the ribs. Skull: one area of rarefaction. Femur and lumbar spine: N.A.D. Dorsal spine: no areas of destruction.

Diffuse Type

Case 22.—Woman aged 66. Presenting symptoms: pain in dorsal and lumbar regions for two years; increasing kyphosis for past six months; poor general condition, with marked kyphosis. *X*-ray films showed general decalcification of dorsal spine. No destructive lesion in ribs or spine. Sternal puncture: positive for myelomatosis. Patient developed paraplegia within one month of examination and died.

Case 23.—Woman aged 68. Presenting symptoms: (1) dorsal pain for eighteen months, *x*-ray film one year previously showing osteoarthritic change, for which physiotherapy gave some relief; (2) increasing kyphosis over the past six months. *X*-ray films showed general decalcification and collapse of all dorsal vertebrae. No other destructive lesion in spine or ribs. Blood: total protein, 10.3 g.% (albumin 3.8 g., globulin 5.88 g.); A/G ratio, 1 : 1.5; Hb, 48%; W.B.C., 3,000; calcium, 10.5 mg. per 100 ml.; phosphorus, 4.8 mg. per 100 ml.; alkaline phosphatase, 4.6 units. Sternal puncture: typical of myelomatosis. Urine: Bence Jones proteose absent initially, but present three weeks later. Stilbamidine therapy given. Died within two months of conclusion of course.

Case 24.—Woman aged 72. Presenting symptoms: exhaustion for two years; low back pain for nine months. *X*-ray film showed diffuse decalcification of dorsal and lumbar spine with collapse of D 12. Disk spaces intact. Ribs decalcified, but no destructive lesion. Three months later, *x*-ray examination showed further collapse of D 12 and fractures of ribs, but no changes in skull. Sternal puncture: typical myelomatosis picture. Blood: Hb, 55%; W.B.C., 4,000; blood urea, 72 mg. per 100 ml.; total protein, 12 g.% (albumin 3.8 g., globulin 8.2 g.); A/G ratio, 1 : 2.36; E.S.R., 67 mm.; serum calcium, 13.8 mg. per 100 ml.; phosphorus, 3.5 mg. per 100 ml.; alkaline phosphatase, 10.4 units. Urine: albuminuria present; Bence Jones proteose absent. No treatment given. Diagnosis confirmed at necropsy.

Case 25.—Man aged 67. Presenting symptoms: low back pain for six weeks. Nothing abnormal on examination. *X*-ray film showed collapse of D 11; chest and ribs, N.A.D. Blood: Hb, 83%; W.B.C., 4,100; E.S.R., 55 mm.; total protein, 7.8 g.%; A/G ratio normal. Thought to be secondary carcinoma, but no primary neoplasm discovered. Deep *x*-ray therapy given, with relief of pain. *X*-ray examination two months later showed no further changes. Four months later patient developed severe pain and anaemia. Blood: Hb, 51%; W.B.C., 4,600; total protein, 10.6 g.% (albumin 2.1 g., globulin 6.5 g.); A/G ratio, 1 : 3. *X*-ray films showed general demineralization of spine and ribs, but further collapse of D 11, with collapse of L 1 and 2. Sternal puncture: negative. Died two months later. *Comment:* Note the late appearance of serum protein changes.

Discussion

From a study of these cases we see that the large solitary myeloma occurs in the younger age group (average 40 years), but ultimate spread to the multiple form was experienced in all our cases. The diffuse form occurred in subjects over the age of 60 and proved to be the most difficult type to diagnose. The sex ratio in the solitary type was 3 males to 1 female, whilst in the multiple type the female sex predominated (11 females to 7 males). Of the discrete multiple type, two (Cases 16 and 17) were initially diffuse, and discrete punctate lesions developed after an interval, while simultaneous general decalcification was present in Case 14.

Local pain is the most common initial symptom, but pathological fracture and paraplegia are frequent presenting symptoms. The destruction of isolated vertebrae is apt to be confused with secondary carcinoma, and full investigation must be carried out in all cases. This should consist of: radiographic examination of the skull, ribs, and vertebrae; estimation of the total serum proteins and serum albumin and globulin; examination of the urine for Bence Jones proteose; and sternal marrow puncture.

The presence of Bence Jones proteose in the urine is a useful confirmatory test, but is often negative in the multiple cases, and its absence is of no significance in diagnosis. Further, it may be present rarely in other conditions—for example, secondary carcinoma of bone and myelogenous leukaemia.

In our series the test was positive in seven and negative in seven of the cases in which multiple lesions were present. It is negative while a myeloma remains solitary. This approximates to the figures given by Bayrd and Heck (1947), who found the test positive in 53% of the cases.

The serum-protein changes, when present, are diagnostic. There is usually a rise in the total serum protein, due to increase in the globulin fraction, leading to reversal of the albumin/globulin ratio. In the multiple cases in our series these changes were present in 13 and absent in 4, whilst they were not recorded in 4 cases. The change took place at a very late stage in Case 25. A normal serum-protein value does not exclude the diagnosis of myeloma, and the test has no prognostic value.

The blood picture varied extensively, but a severe reduction of the red-cell count was present only in the later stages of the disease in the multiple lesions, while little change in the white-cell count was experienced. A count within or near normal limits may be obtained in the presence of myelomata. A high E.S.R. was often recorded, and this may be associated with the increased serum globulin, as is the phenomenon of the increased rouleaux formation often seen in this disease. Sternal puncture was performed in 14 cases, with a positive diagnosis of myelomatosis in 12 of these.

In reaching a diagnosis we wish to emphasize the need for radiological examination of all bones and completion in all the tests discussed. Biopsy is usually required in the solitary type, as radiological differentiation from osteoclastoma is usually impossible. In lesions of the vertebrae we noted that decalcification followed by compression and destruction occurred, but the intervertebral disks were not affected. In this respect the condition resembles secondary carcinoma and differs from a tuberculous lesion. The frequency of backache as an initial symptom is noteworthy, and the condition should be borne in mind as the cause of such symptoms in the elderly, especially in the presence of osteoporosis and where the pain is unrelieved by rest or immobilization.

Treatment

The results of all forms of treatment make dismal and depressing reading, as these are of no avail in preventing the ultimate death of the patient. One wonders if the patients would not live equally long without treatment. Tennant (1945) described the case of a patient who was still alive five years after diagnosis and who had received no treatment. In our series one was still alive after the appearance of myeloma of the spine two years previously, although a course of stilbamidine had been given recently; while one was still alive seven years after deep *x*-ray treatment of an initially solitary tumour.

Of those initially solitary, in this series two were given deep *x*-ray therapy, one being still alive seven years after initial treatment, the other being still alive one year after treatment. One patient died without treatment, and the remaining case did not survive local excision.

It would seem that deep *x*-ray therapy is of no value in prolonging life in the multiple form, at least when administered when the full clinical picture is present. It is probable that this is the end-stage, and all treatment then will be of no avail. Deep *x*-ray therapy is of palliative value in relieving localized pain. Eight cases had such therapy alone, and seven survived an average of only nine months, the longest survival being two years. Three had deep *x*-ray therapy combined with stilbamidine, and died without the treatment having any appreciable effect on the course of the disease.

We have no proof of the value of stilbamidine in the treatment of myelomatosis. Three were treated with stilbamidine alone, and two died within two to four months of treatment. One was still alive six months after therapy. Nitrogen mustard administration also had no therapeutic value.

Consideration of this series of cases suggests that myelomata are not rare, but if the possibility of the presence of the condition is not realized diagnosis is belated. Early and full investigation should be made with this in mind. Full radiological investigation is also of value from the prognostic aspect, as cases in which the myeloma is initially solitary have a longer survival. Successful treatment of malignant disease requires early diagnosis, yet, with myelomata, we have tended to diagnose only the fully established condition. An analogous position would be where diagnosis of carcinoma or sarcoma is made only when metastases are present: when such a condition is reached treatment is of no avail. Hence we can expect little else if we wait until the similar dissemination has occurred with myelomata before we begin treatment.

We believe that the present textbook description of multiple myeloma is that of the end-stage of the disease and that it is analogous to the condition of general carcinomatosis. For efficient treatment we must diagnose the lesion at a much earlier stage. This problem still remains, but if we bear in mind that myeloma is a much more common condition than it was thought to be, we may be able to observe its early manifestations.

Summary

Twenty-five cases of myeloma of bone are reviewed to call attention to their frequency, as it is thought that they are not so rare as one is led to believe.

The difficulty of diagnosis of a disease which is often present in the absence of symptoms is discussed.

Treatment at present available has a questionable effect on the ultimate fate of the patient, but deep *x*-ray therapy has a definite place in the relief of pain and may prevent the onset of paraplegia when given to affected vertebrae. A case surviving seven years is recorded.

We are indebted to our staff colleagues at the Bradford Hospitals and to Dr. J. W. Hirst, of Huddersfield, for permission to review cases under their care.

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In his annual report for 1952 Dr. W. S. Walton, medical officer of health of Newcastle-upon-Tyne, describes the unsatisfactory housing conditions in that city. Though progress has been made in the building of new houses, "the city has a very long way to go before the living conditions of many of the inhabitants can be brought up to what might be termed ordinary reasonable English health standards of the mid-twentieth century." Out of every 100 households in the city 38 do not possess a separate bath, 18 are without separate water-closet, and 17 have no piped supply of water. About 18,800 of the 87,800 households in the city at the time of the 1951 census lived in one- or in two-roomed "dwellings." The index of persons per room—0.88 in Newcastle—is one of the highest for any area in England and Wales.

HAEMOPTYSIS, BRONCHIECTASIS, AND FOREIGN BODY IN LUNG

BY

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Parents and doctors are often amazed by the variety of objects, other than food, that children delight in placing in their mouths. Some of these are swallowed, but a few are inhaled, and the consequences are then usually dramatic. If not coughed up and out immediately, early bronchoscopy may be urgently necessary.

Occasionally, however, there is merely a short, easily forgotten episode of choking after such an inhalation. No more is thought of the incident until, maybe years later, the patient presents with symptoms and signs of segmental putrid bronchiectasis, in which the inhaled foreign body may be found. Jackson and Jackson (1950) mention 1,485 patients with bronchial foreign bodies; in 200 the diagnosis was overlooked for periods ranging from one month to forty years. Other and similar cases are reported by Leary (1950) and by Glennie, Dark, and Lindars (1952).

As foreign bodies are commonly inhaled by children, if a mother insists that her child has "swallowed something down the wrong way," or with something in its mouth has choked, gagged, or coughed, attention should be paid to the story and every practicable investigation be carried out to exclude the presence of a foreign body in the respiratory tract; laryngoscopy and bronchoscopy may be essential, as often there are no immediate radiological changes in the lungs. However, apart from possibly revealing the impacted material, radiology may help further in the diagnosis by showing an alteration in aeration of the affected lung. It is essential in this procedure to obtain, in addition to a lateral radiograph, a postero-anterior radiograph of the chest both in inspiration and in expiration (Asherson, 1940).

In the three patients whose clinical histories are given below, the foreign bodies were probably present for 12 months, 5 months, and 6 weeks respectively before being removed. All were composed of vegetable matter, and none could be seen radiologically. In the second patient, however, radiological evidence of obstructive emphysema was obvious, and in the third patient there was clinical and radiological evidence of pulmonary collapse. The first case was unusual in that the patient had recurrent severe haemoptyses—a departure from the typical clinical syndrome which merits special emphasis.

Case 1

On July 1, 1951, a boy aged 5 choked over a piece of "grass in seed." His mother tried to retrieve it by putting her finger down his throat, but, being unable to make him cough it up, assumed he had swallowed it. Five days later he complained of colicky central, and later right-sided, abdominal pain, loss of appetite, and constipation. He also had a painful cough and almost continual generalized chest pains.

On July 7 he was admitted to hospital. Examination then revealed a flushed ill-looking boy with a temperature of 102.4° F. (39.1° C.) and obvious respiratory distress. Respirations, at a rate of 30 a minute, were grunting and inverted, his alae nasae were working and there was slight cyanosis of his lips. The chest showed diminished movement, and impaired percussion note and air entry on the right side, with a pleural rub and crepitations at the right base. The tongue was dry and furred, and oral fetor was present. There was some guarding and tenderness in the right upper abdomen. Throat and mouth swabs showed normal mixed flora. The Hb was 13.3 g. (90%); W.B.C. 23,500 per c.mm. (83% neutrophils). Degenerated pus cells and a few organisms were seen in the sputum. Culture yielded a moderate growth, chiefly *Streptococcus viridans*. Mantoux 1 in 1,000 was negative. An *x*-ray film of the chest showed pleural effusion at the right base with probably consolidation in the anterior segments of the right lower lobe.

As the boy was obviously ill on admission, he was placed in an oxygen tent and treated for supposed pneumonia with "sulphatriad" and penicillin. Chest radiographs taken two days after admission showed an abscess cavity with a fluid level in the right lower lobe and a right pleural effusion. As there was no apparent response to treatment after 48 hours, chloramphenicol was given, and 48 hours later, again because of lack of clinical response, it was replaced by aureomycin. This was continued for two weeks, sulphadiazine being given for the first six days of this course. He remained very unwell, with a high swinging temperature. Subsequent chest radiographs showed a second abscess cavity to have formed alongside the first, with accompanying consolidation of the right middle lobe and increase in size of the right pleural effusion. Pleural aspiration was attempted, but no pus was obtained. Because he was so ill treatment with chloramphenicol was repeated, but with no better result than before.

Eighteen days after admission he coughed up a little sticky yellow sputum for the first time and produced a larger quantity on subsequent days, from which a culture yielded a moderate mixed growth of *Str. viridans*, *Staphylococcus aureus*, and a scanty growth of *Candida*. His temperature soon settled, and with physiotherapy he became more active and his appetite improved. A chest radiograph showed some residual pleural thickening at the right base only. On September 11 he was discharged to convalescence. There he remained well until October 3, when he developed a loose cough and shortly afterwards had repeated small haemoptyses. There were clinical and radiological signs of partial collapse of the right lower lobe, so that on October 31 he was readmitted to hospital.

At this time he was afebrile, looked fairly well, and, apart from the above signs, the only new feature noticed since his previous admission was early finger- and toe-clubbing.

Bronchoscopy on November 2 showed that the whole tracheo-bronchial tree was hyperaemic, and a purulent discharge was observed coming from the right main bronchus. A bronchogram done on November 15 showed poor filling of some segments of the right lower lobe.

The boy had repeated and alarming haemoptyses, though remaining afebrile. On November 24 he coughed up about 6 oz. (170 ml.) of blood with a piece of tissue which was reported histologically to be "vegetable matter." There were no further symptoms until two weeks later, when he had a moderate pyrexia. A second bronchoscopy on January 4, 1952, under "cover" of aureomycin, showed no changes from those seen previously, and thereafter he was afebrile, fairly well, and, in fact, was discharged on January 22 to a convalescent home. After a short period he produced increasing amounts of pink-stained sputum which later became frankly blood-stained. On February 11 this amounted to about 4 oz. (114 ml.) in 12 hours. He was therefore again admitted to hospital, where he was found to be pale and slightly cyanosed, with a significantly greater degree of finger-clubbing, a mucopurulent nasal discharge, and clinical signs of collapse of the right lower lobe. Culture of his sputum yielded a profuse growth of "mixed organisms" sensitive to aureomycin only.

On February 14 the third bronchoscopy showed the right bronchial tree full of foul fetid pus. Further radiological

investigations, including tomograms, showed no more than collapse at the right base. Considerable difficulty was experienced in controlling secondary staphylococcal lung infection, but a further bronchoscopy on May 21 showed this was now much less, and despite general clearance of the exudate a foreign body was not found. Haemoptyses, varying from 6 to 19 oz. (170 to 540 ml.) in 24 hours, continued, and on July 3 the right lower lobe was removed. On examination and dissection of the excised tissue it was noted that the lobe contained a cavity in the posterior basal segment which was in direct communication with a bronchus and might well have been a fusiform dilatation of a bronchus. It was filled with vegetable matter resembling an ear of wild barley (see Fig. 1).

FIG. 1.—Case 1. Cavity in posterior basal segment of right lower lobe in which an ear of corn (inset) was found.

Case 2

A female infant aged 18 months, the only child of healthy parents, had a cold in August, 1952, and a cough had since persisted for which her own doctor saw her in November. She was then febrile, and examination of the chest showed significantly diminished air entry over the left mid-zone posteriorly. Despite an inconclusive diagnosis she was treated with penicillin, and the temperature returned to normal. Subsequently, a radiograph of the chest was reported to show "epituberculosis of the left upper zone." At this stage she was referred to hospital.

Her listlessness had returned and her cough was more severe. Examination at this time, approximately five months after the onset of her cough, revealed a moderately well nourished but pale and somewhat wasted child in whom the only abnormal signs were confined to the respiratory system.

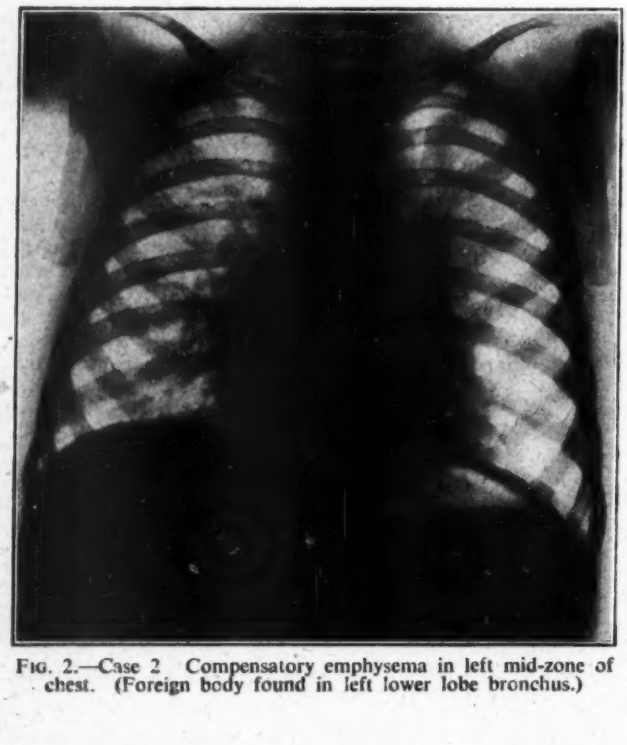

FIG. 2.—Case 2. Compensatory emphysema in left mid-zone of chest. (Foreign body found in left lower lobe bronchus.)

There was no finger-clubbing or evidence of mediastinal displacement. Movement and air entry were diminished on the left, but the percussion note was considered to be equal on the two sides of the chest and no adventitious sounds were detectable. Radiological examination showed collapse of the left upper lobe and part of the left lower lobe, and indicated also some compensatory emphysema of the remaining portion of the left lung (Fig. 2). The left hilar shadow was enlarged. It therefore seemed that there was obstruction to the left lower lobe bronchus, either the result of hilar adenitis due to tuberculosis or pertussis, or as the result of an inhaled foreign body. Tuberculosis was excluded by negative Mantoux tests. On direct questioning a "choking attack," was remembered by the mother and thought to have occurred with a sweet. This was thought to favour the presence of a foreign body, and the child was consequently admitted for bronchoscopy on December 26. The haemoglobin was 12.4 g. (84%) and the white-cell count 12,700 per c.mm. (neutrophils 9,600).

A bronchoscopy was performed on December 31. Vascular granulation tissue was seen in the left lower lobe bronchus, and below it a foreign body; this was removed and was subsequently shown to be a burr (fruit of *Agrimonia eupatoria*).

Subsequently, auscultation showed that air entry over the affected part of the chest had improved. There followed a short period during which signs of left lung collapse recurred, but with the aid of intramuscular penicillin and physiotherapy clinical and radiological recovery was complete. A bronchogram done later showed no abnormality.

Case 3

A boy aged 2½ developed a cough at the beginning of January, 1953. As his six siblings were thought to have whooping-cough at the time, his cough was attributed to this infection. He developed signs of bronchitis, which resolved when treated with sulphadimidine. However, a week later his cough returned and signs of collapse of the right lower lobe were detected. Despite courses of chloramphenicol and penicillin, these signs persisted and he had a constant fever. He was therefore referred to hospital on February 12. He was afebrile and looked pale. Abnormal physical signs were confined to the respiratory system. Signs of collapse of the right lung base were found clinically and confirmed radiologically. After admission the Mantoux 1 in 10,000 and 1 in 1,000 was negative; the E.S.R., 44 mm. in 1 hour (Westergren); haemoglobin, 78% (11.6 g.); white-cell count, 13,700 per c.mm. (neutrophils 6,800).

As the collapse of the right lower lobe was known to have been present for at least six weeks a bronchoscopy was performed on February 23. The right stem bronchus was obstructed by vascular granulation tissue, in the centre of which lay a friable white foreign body. This was removed in one large and several small pieces and appeared to be a nut. No gross damage to the wall of the bronchus could be seen. Re-expansion of the collapsed portion of lung was aided by physiotherapy, and three weeks later the collapsed lobe appeared clinically and radiologically to be fully aerated. On April 9 a bronchogram showed a mild degree of bronchiectasis of all the right middle and lower lobe bronchi. Physiotherapy was continued, and a bronchogram taken six months later showed the bronchial tree to have returned to normal.

Discussion

Ears of corn, grasses, and other vegetable matter may easily be inhaled; they may prove to be more dangerous than some inorganic or hard organic substances such as bone or teeth, particularly as vegetable matter may swell by imbibition and increasingly irritate the tracheo-bronchial mucosa. Often, in a matter of weeks or months, exuberant granulation tissue forms around such matter, and this reactionary mucosal swelling, when touched, bleeds easily, and

usually indicates the presence of a foreign body. This type of bronchial granulation tissue was seen in Case 1.

Inhaled material may travel far along the respiratory tract, and there are several reports of foreign bodies ultimately reaching the pleural cavity (Graham, 1929; Davidsohn, 1931) without the appearance of symptoms. Occasionally the inhaled foreign body has gradually penetrated the thoracic parietes and presented as a chest-wall swelling (Seydell, 1937; Sehring and Shaw, 1948) which might have the characters of a pointing empyema.

Mayo (1836) reported that "a boy, aged about 12, who was travelling in a carriage, happened to have an ear of rye in his mouth: the carriage being jolted, the ear of rye disappeared: it had dropped into the lungs, where it produced abscess." At necropsy the offending ear was found in an abscess involving the lungs and liver. Lung abscesses are, however, uncommon in children. Thus Brock (1952), in an analysis of 477 cases of lung abscess, found that only 15 (3.1%) occurred in children under 14 years of age, and none of these were considered to be due to foreign bodies. The same author quotes other workers for details of the incidence of lung abscess in children, with a variation from 2.6% to 18.3%. In a total of 2,250 lung abscesses reported in the American literature (Smith, 1934), of 59 abscesses in infants and children only 1 was recognizably due to an inhaled foreign body. Hence, on the evidence available, lung abscess would not appear to be a common sequel to the inhalation of a foreign body.

Owing to the anatomical distribution of the bronchial tree, foreign bodies are more common in the right than in the left lung and are particularly rare in the right middle lobe.

As stressed already, the symptoms may be delayed for a very variable period, possibly for weeks or even months. Cough is common and later becomes productive. Occasionally the sputum is blood-streaked, but frank and recurrent haemoptyses of several ounces at a time, such as occurred in Case 1, are distinctly unusual. A search of the literature has revealed only three other examples of haemoptysis occurring as the result of foreign bodies in the lungs. This is perhaps rather surprising considering how often the presence of a foreign body in a bronchus promotes the formation of vascular granulation tissue, which bleeds so easily when touched through a bronchoscope.

Flandin and Poumeau-Delille (1932) report the case of a patient aged 24 who was investigated for tuberculosis on account of recurrent haemoptyses. Eventually radiological examination revealed a needle in his lung. Linneweh (1935) reports a rather similar case. In 1918 a man aged 28 sustained a grenade splinter wound in his neck. Over the next 17 years he was investigated for recurrent haemoptyses and, finally, following a fatal haemorrhage, it was found that this splinter had travelled to the right main bronchus and had eventually penetrated a major blood vessel. Steiner (1947) reports a most extraordinary case of a patient who introduced a metal sound into the vagina in order to procure an abortion; this was lost and "forgotten about." Eventually the sound migrated to the left lung and caused severe haemoptysis. It was removed at operation, but the patient died one month later.

Despite three bronchoscopies the correct diagnosis in Case 1 was not made for a considerable time. This case was further misleading in that the patient appeared to recover for a time after coughing up the first foreign body; his relapse was due to a suspected second foreign body which could not be seen. It should be stressed, therefore, that, in a patient who may have inhaled a foreign body, full radiological investigation and expert bronchoscopy may be required, and even then the object may be beyond the range of view. If symptoms and signs persist after the removal of a foreign body the presence of a second one should be suspected. As bronchiectasis is sometimes a sequel to the inhalation of foreign material, a bronchogram should always be done once all such material has been removed. Case 3 exemplifies this.

Summary

The reports are presented of three children who inhaled foreign bodies. In the first, lung abscesses developed which were followed by severe and alarming recurrent haemoptyses. After 12 months' illness a lobectomy revealed an ear of corn in the removed lung. The other two patients had persistent coughs. In the second there were clinical signs of obstructive emphysema, and in the third signs of pulmonary collapse. After removal of a foreign body from the latter patient, bronchiectasis was found to be present.

The literature is reviewed and the following points are stressed: (1) The rarity of lung abscess in children even as a complication of inhaled foreign bodies. Chronic suppuration of unknown aetiology, occurring in the right lung especially, should, however, suggest the presence of a foreign body. (2) Haemoptysis is an uncommon complication of an inhaled foreign body. (3) The value of a complete radiological investigation and the importance of expert bronchoscopy in children alleged to have inhaled or choked over any object. (4) As bronchiectasis is often a sequel to the inhalation of a foreign body, bronchography is usually essential after the foreign body has been removed.

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The City Analyst of Birmingham, Mr. H. H. Bagnall, has been looking into the potency of the oral penicillin tablets sold in local pharmacies. During five months last year 82 samples were examined. Twelve samples had less than 80% of the prescribed potency. Of these, four contained less than 10% of the stated amount of penicillin, which Mr. Bagnall interprets by saying that "a patient stands a one in twenty chance of being supplied with tablets entirely devoid of any therapeutic value." The cause of the loss of potency appears to have been moisture admitted when the manufacturers' sealed containers were opened to dispense smaller numbers of the tablets. In his report (for the Third Quarter of 1953) Mr. Bagnall points out that this state of affairs is likely to be widespread in the country, but only in the largest centres is it possible for city analysts to undertake the research necessary to uncover it. As a solution, he suggests the establishment of about half a dozen regional laboratories to monitor the dispensing of the "wide range of new drugs listed in the *Pharmacopoeia* which have never yet come under the purview of the public analyst."

TUBERCLE BACILLI RESISTANT TO ISONIAZID

VIRULENCE AND RESPONSE TO TREATMENT WITH ISONIAZID IN GUINEA-PIGS

BY

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Barnett, Bushby, and Mitchison (1953a, 1953b) found among strains of tubercle bacilli an apparent relation between their degree of resistance to isoniazid and their virulence in guinea-pigs and mice. Strains with a high degree of resistance were of low virulence, whereas those with only a slight increase in resistance were fully virulent. However, only three out of the eight strains employed were recently isolated from human lesions. Furthermore, even with these three strains the virulence of sensitive cultures isolated from the same patients before treatment with isoniazid was not tested. To meet these objections the virulence of eight pairs of freshly isolated sensitive and resistant strains has been investigated in guinea-pigs. The response to treatment at a level comparable to that used in man was also found by treating half of the animals with 4 mg. of isoniazid per kg. per day, given by subcutaneous injection.

Methods

Strains.—The eight pairs of sensitive and resistant strains were obtained from the sputum of eight patients in the Medical Research Council (1952) trials of isoniazid. The sensitive strains, obtained before treatment with isoniazid, had been subcultured not more than three times over a period of up to six months before preparation of the inoculum. The resistant strains, obtained during or up to three months after treatment with isoniazid, were isolated on isoniazid-free Löwenstein slopes and were then subcultured twice on slopes containing isoniazid in concentrations shown in Table II. In this way admixture of organisms with a lower degree of resistance was eliminated.

The inoculum for infecting the guinea-pigs was obtained by suspending the growth from 12- to 17-day-old Löwenstein cultures in Tween–albumin medium. Quantitative sensitivity tests on Löwenstein medium and viable counts on oleic-acid–albumin agar were set up from all the suspensions as described by Barnett *et al.* (1953b).

Guinea-pig Experiments.—An injection of 0.1 mg. (moist weight) of each strain was given into the right thigh of six guinea-pigs. One subgroup of three of these animals received no treatment and the other three were given 2 mg. of isoniazid per kg. subcutaneously at both 10 a.m. and 5 p.m. daily, except on Saturdays, when only one dose was given, and on Sundays, when none was given. Treatment was begun immediately after infection and was continued till the animals either died or were killed. Pairs of guinea-pigs, consisting of one treated and one untreated animal, were killed after 6, 10, and 14 weeks. If any animal died spontaneously, none was killed in that subgroup at the next appointed time. At the necropsy a histological examination was made of the spleen, liver, and lungs of all animals in which there was little or no macroscopic tuberculosis, and of some of the remaining animals with visible disease. The degree of tuberculosis was scored out of a possible total of 100 as described by Barnett *et al.* (1953b). Portions of the spleens from animals infected with the resistant strains and from treated animals infected with the sensitive strains were cultured on Löwenstein slopes, and a sensitivity test to isoniazid was carried out by the Medical Research Council (1953) method on any growth of tubercle bacilli that appeared. Serum isoniazid concentrations were estimated by Dr. S. W. A. Kuper, of the Brompton Hospital, using the method of Cuthbertson, Ireland, Woolf, and Kuper (1954).

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Results

Sensitive Strains.—All the untreated guinea-pigs infected with the sensitive strains developed widespread tuberculosis, which was often fatal within nine weeks, as shown in Table I. The average score for the amount of tuberculosis varied from 53 to 89. Among the guinea-pigs infected with the sensitive strains and treated with isoniazid there were 18 out of 24 with no macroscopic or histological evidence of tuberculosis. In the remaining six animals there was some tuberculous involvement at the site of inoculation or in the inguinal glands. The average scores, shown in Table I, varied from 0 to 3.3. These findings demonstrate the protective ability of isoniazid in the dosage used.

TABLE I.—*Results in Guinea-pigs Infected with Eight Sensitive Strains*

Strain	Viable Units Injected Oleic-acid–albumin agar	Untreated Guinea-pigs Dying from Tuberculosis		Average Amount of Tuberculosis out of 100	
		No. out of 3	Days till Death	Untreated	Treated
O'T ..	$2{\cdot}4\times10^6$	2	57, 62	73	0
McF ..	$4{\cdot}3\times10^6$	3	39, 46, 57	81	1·3
L ..	$4{\cdot}2\times10^6$	2	55, 60	89	3·3
McK ..	$2{\cdot}7\times10^5$	0	—	60	0
H ..	$7{\cdot}9\times10^6$	1	86	53	1·3
Ri ..	$6{\cdot}6\times10^6$	2	49, 49	65	2·7
Ru ..	$4{\cdot}9\times10^6$	1	50	79	0
Fy ..	$3{\cdot}8\times10^6$	2	60, 62	76	2·7

Resistant Strains.—The results of the quantitative sensitivity tests on all eight of the resistant strains, together with one typical sensitive strain, are shown in Table II. The amount of tuberculosis in the guinea-pigs infected with the resistant strains is shown in Table III. In animals with

TABLE II.—*Results of the Quantitative Sensitivity Tests. Log_{10} Viable Units Per mg. of Bacilli*

Strain	Isoniazid Concentration μg./ml.							
	0	0·2	1	5	10	50	200	500
O'T sensitive ..	7·3	<2						
O'T resistant ..	7·2	7·2	<2					
McF	7·1	7·1	7·1	<2				
L	7·6	7·6	7·6	<2				
McK	5·9	5·9	5·5	3·8	3·2	<2		
H	6·9	6·9	6·9	6·9	6·9	3·1	<2	
Ri	6·0	7·0	7·0	7·0	7·0	3·6	<2	
Ru	7·2	7·2	7·2	7·2	7·2	6·6	3·2	<2
Fy	7·4	7·4	7·4	7·4	7·4	7·4	4·3	<2

TABLE III.—*Results in Guinea-pigs Infected with Eight Resistant Strains*

Strain	Minimal Inhibitory Concentration of Isoniazid (μg./ml.)	Isoniazid Concentration during Sub-culture (μg./ml.)	Viable Units Injected Oleic-acid–albumin agar	Average Amount of Tuberculosis out of 100	
				Untreated	Treated
O'T ..	1	0·2	$5{\cdot}1\times10^6$	78*	30
McF ..	5	0·2	$6{\cdot}8\times10^6$	58	64†
L	5	0·2	$7{\cdot}7\times10^6$	22	30
McK ..	5	0·2	$3{\cdot}3\times10^5$	11	14
H	50	10	$5{\cdot}0\times10^6$	13	22
Ri	50	10	$4{\cdot}8\times10^6$	11	12
Ru	200	50	$3{\cdot}7\times10^5$	10	6
Fy	500	50	$2{\cdot}5\times10^6$	15	20

* Two animals died from tuberculosis on the 64th and 77th days.
† One animal died from tuberculosis on the 83rd day.

scores of up to 20 there was a caseous abscess at the site of inoculation and a variable amount of caseation in the draining lymph nodes. The liver, spleen, and lungs, though macroscopically normal, often contained small tubercles or collections of histiocytes and lymphocytes. A score of 20 to 50 indicated macroscopic disease in the spleen, liver, and lungs, though less than would be found in animals infected with a fully virulent strain. Widespread generalized tuberculosis was present in animals with a score of over 50.

Virulence and Degree of Resistance.—As can be seen from Table III, an increase of resistance to isoniazid was associated with a decrease in the virulence of the strains. The scores of the amount of tuberculosis in untreated animals ranged from 78, caused by the strain with the lowest degree of resistance, to 10 to 15 caused by the four strains with the highest degrees of resistance. This relation can best be shown by including with the present results those obtained by Barnett *et al.* (1953a, 1953b), using other resistant strains, and also the results on a further two highly resistant strains (Table IV). One of these was obtained from a patient under treatment with isoniazid and the other was a resistant variant of the H37Rv strain obtained from Professor R. Knox, of Guy's Hospital, and used by Goulding and Robson (1952). Both were injected into two untreated guinea-pigs, which were killed after 10 weeks. In spite of differences in the time between infection and killing, all these strains could be classified into three categories of virulence : high or just subnormal (scores of above 50), intermediate (scores from 20 to 50), and low (scores below 20). A well-marked correlation between the degree of resistance to isoniazid and loss of virulence is shown.

TABLE IV.—*Relation Between the Virulence and the Degree of Isoniazid Resistance of 17 Strains of Tubercle Bacilli*

Virulence	Degree of Isoniazid Resistance			
	Growth on 0·2 μg./ml. Not on 1	Growth on 1 μg./ml. Not on 5	Growth on 10 μg./ml. Not on 50	Growth on 50 μg./ml.
High or just subnormal	3	2	0	0
Intermediate	0	1	1	0
Low	0	1	2	7*

* Three of these strains were variants of the laboratory strain H37Rv.

Stimulation of Virulence by Treatment.—The individual scores of guinea-pigs infected with the six strains of the present series which were of relatively low virulence are shown in Table V. In untreated animals the disease tended to heal, as demonstrated by the fall in the average scores and the decrease in the proportion of animals showing lesions in the spleen, liver, or lungs during the period from 6 to 14 weeks after infection. The average scores of treated guinea-pigs killed at 6 and 10 weeks were the same as those of similar untreated animals. However, among animals killed at 14 weeks the score in those that were treated was 22, whereas in those that were not treated it was 11. This higher average in the treated animals was due to those infected with strains L, H, and Fy. It can be seen that these three strains were slightly more virulent in the untreated animals than were the remaining strains. Thus there is a suggestion that, among resistant strains of low virulence those which were the more virulent appeared to have had their virulence increased by treatment with isoniazid between the 10th and 14th weeks after infection.

TABLE V.—*Amount of Tuberculosis in Guinea-pigs Infected with Six Resistant Strains of Low Virulence*

Strains	Amount of Tuberculosis out of 100							
	Untreated Animals Killed at				Treated Animals Killed at			
	6 Weeks	10 Weeks	14 Weeks	Average	6 Weeks	10 Weeks	14 Weeks	Average
McK ..	12−	10−	10−	11	16±	17±	10−	14
Ri ..	16±	10−	8−	11	17±	11−	8−	12
Ru ..	12±	10±	8−	10	10±	0−	8−	6
L ..	33+	17±	16−	22	15±	17±	59+	30
H ..	18±	10−	12−	13	31+	15±	20+	22
Fy ..	18±	15±	13±	15	20±	12−	29+	20
Average	18	12	11		18	12	22	

+: Macroscopic tuberculosis in spleen, liver, or lungs.
±: Histological but not macroscopic tuberculosis in spleen, liver, or lungs.
−: Normal spleen, liver, and lungs.

Response to Treatment.—Treatment with isoniazid afforded partial protection to the animals infected with strain O'T, which grew on 0.2 μg. per ml. but not on 1 μg. per ml.; their score was 30 (Table III). The scores in the treated animals infected with three strains, McF, L, and McK, capable of growth on 1 μg. per ml. but not on 5 μg. per ml., were in each case higher than in the untreated animals. Whether or not the strain can grow on 1 μg. per ml. therefore seems to determine whether the infection will respond *in vivo* to treatment at 4 mg. per kg. per day.

Viable Counts.—Barnett *et al.* (1953b) found that two highly resistant strains gave much lower viable counts on oleic-acid–albumin agar than on Löwenstein medium. These differences were thought to be due to abnormal nutritional requirements of the strains. In the present investigation (Tables II and III) the counts on oleic-acid–albumin agar were equal to or slightly greater than the counts on Löwenstein medium except with the resistant strain Ru, which yielded counts of 3.7×10^6 and 1.5×10^7 respectively per mg. of bacilli.

Spleen Cultures.—Out of 21 spleens from treated guinea-pigs infected with sensitive strains, 2 yielded growth of tubercle bacilli. One of these strains was sensitive to isoniazid. The other grew on 0.2 μg. per ml. but was inhibited by 1 μg. per ml. None of the 19 cultures recovered from animals infected with the resistant strains showed any alteration in the degree of resistance from the strain injected.

Serum Isoniazid Concentrations.—The serum isoniazid concentration of guinea-pigs injected with doses of 2 mg. per kg. are shown in Table VI. For comparison mean values for isoniazid concentrations, performed by the same method, in sera from 16 patients receiving 1.4 to 2.6 mg. per kg. by mouth were taken from the figures of Cuthbertson *et al.* (1954). If allowance is made for differences in the speed of absorption due to the different routes of administration it will be seen that the values obtained in man and in guinea-pigs were very similar. The serum concentrations in guinea-pigs injected with doses of 10 mg. per kg. were substantially higher.

TABLE VI.—*Serum Isoniazid Concentrations in Patients and Guinea-pigs*

Time After Dose	Average Serum Isoniazid, μg./ml.		
	Patients; Oral	Guinea-pigs; Subcutaneous	
	1·4–2·6 mg./kg.	2 mg./kg.	10 mg./kg.
½ hour	0·9	2·3	9·9
1 „	1·2	1·7	5·4
2 hours	0·8	0·7	—
4–17 „	—	<0·5	<0·5
No. of patients or animals on which each average based	10	3	2

Discussion

The low virulence to guinea-pigs of strains of tubercle bacilli resistant to isoniazid has also been reported by Barry, Conalty, and Gaffney (1953), although they did not state the degree of resistance of their strains isolated from patients. Since these strains also lack virulence in mice

(Barnett *et al.*, 1953b) and in rabbits (Domagk, quoted by Klee, 1953) it would seem probable that they would be of low virulence in man. However, patients in the Medical Research Council (1952) trials who developed resistant strains (growth on Löwenstein slopes containing 1 μg. of isoniazid per ml.) benefited less from treatment with isoniazid than did those whose strains remained sensitive.

There seem to be three possible explanations for the apparent contradiction. In the first place, even the most highly resistant strains set up large abscesses at the site of inoculation and usually minimal regressive lesions in the spleen, liver, or lungs. Thus these strains are not completely avirulent. Secondly, when strains from patients appear highly resistant in sensitivity tests there may be bacilli with a lower degree of resistance, and therefore higher virulence, in areas of the lungs containing progressive tuberculous lesions. Thirdly, the virulence of resistant strains may be increased by treatment with isoniazid; this may have occurred in the guinea-pigs infected with strains L, H, and Fy, although the numbers of animals were too small to allow a firm conclusion. It has also been reported in mice in three out of four experiments (Barnett *et al.*, 1953b).

Strains growing on Löwenstein slopes containing 1 μg. of isoniazid per ml. did not respond to 4 mg. per kg. per day. The serum isoniazid concentrations of guinea-pigs receiving this dose were similar to those of patients on the same dosage, used in the Medical Research Council (1952) trials. Thus it is reasonable to assume that such strains would also not respond to treatment with isoniazid when present in human lesions. Unfortunately some of the strains growing on 1 μg. per ml. but not on 5 μg. per ml. were still of fairly high virulence (Table IV). An increase in the dosage of isoniazid would be unlikely to inhibit these strains in patients, since they did not respond to a treatment level of 20 mg. per kg. per day in guinea-pigs (Barnett *et al.*, 1953b).

Strains growing on 0.2 μg. per ml. but not on 1 μg. per ml. have been classified as of doubtful resistance in the Medical Research Council (1953) trials. There is justification for this classification, since on 4 mg. of isoniazid per kg. per day such a strain partially responded to treatment, and on 20 mg. per kg. per day there was almost complete response (Barnett *et al.*, 1953a).

Summary

In a study of eight pairs of strains of tubercle bacilli sensitive and resistant to isoniazid it was found that the higher the degree of resistance the lower was the virulence in guinea-pigs. Treatment with isoniazid in a dose comparable to that used in man protected animals infected with sensitive strains, and partially protected animals infected with a resistant strain growing on 0.2 μg. per ml. but not on 1 μg. per ml. It did not protect animals infected with resistant strains growing on 1 μg. per ml., and may, indeed, have increased the virulence of some of these strains.

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BACTERICIDAL ACTIVITY OF STREPTOMYCIN AND ISONIAZID AGAINST TUBERCLE BACILLI

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Garrod (1950) concluded that streptomycin, in concentrations attainable therapeutically in the body, was rapidly bactericidal to cultures of *Mycobacterium tuberculosis* growing in Tween–albumin liquid medium. The speed of killings became more rapid with increasing concentrations of streptomycin. More recently, Mackaness and Smith (1953) have described the bactericidal action of streptomycin, isoniazid, and a combination of these two drugs on similar cultures.

The purpose of the present investigation was to investigate the action of streptomycin and isoniazid, both alone and in combination, on Tween–albumin cultures of tubercle bacilli. An attempt was made to use concentrations of these drugs comparable to those found in treated patients.

Methods

Screw-capped bottles containing 20 ml. of the H37Rv strain of *Myco. tuberculosis* grown for nine days in modified Dubos and Davis Tween–albumin medium (Medical Research Council, 1948) were centrifuged for 10 minutes at 1,000 r.p.m. to remove the larger aggregates of bacilli. The supernatant fluid was removed, and stained films from it showed that 80% of the organisms were single or in pairs.

A volume of 0.5 ml. of this supernatant was added to 4.5 ml. of Tween–albumin medium containing various concentrations of streptomycin, isoniazid, or a combination of both drugs in screw-capped bottles. A control bottle containing no drug was included in each experiment. The bottles were incubated at 37° C. in a hot-air room. At intervals, 0.5-ml. samples were removed from these bottles for viable counts on oleic acid–albumin–agar plates, using a calibrated dropping pipette and loop as described by Mitchison (1953). The diluent employed was Tween–albumin medium. The plates were sealed with wax-coated "cellophane" tape and were incubated for four weeks at 37° C. The numbers of colonies were then counted with a plate microscope.

Where the presence of resistant organisms was suspected sensitivity tests to streptomycin and isoniazid were carried out by the Medical Research Council (1953b) methods. In one experiment the cultures which appeared to contain dead organisms were injected into guinea-pigs. These were killed after 10 weeks and examined for macroscopic evidence of tuberculosis.

Results

Streptomycin.—The bactericidal action of streptomycin alone in concentrations of 2, 20, and 200 units per ml. is shown in Fig. 1. The number of viable units—that is, discrete organisms or clumps developing into single colonies—in the cultures was diminished by a thousandfold after contact with two units per ml. for seven days, 20 units for three days, and 200 units for one day. Thus the higher the concentration of streptomycin the more rapid was the

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†In receipt of a grant from the Medical Research Council.

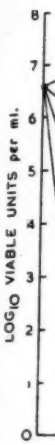

FIG.

FIG. 2

FIG. 3.
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bactericidal activity. The viable count on the culture containing 2 units per ml. began to increase after the 10th day. Streptomycin-sensitivity tests carried out on subcultures from two colonies obtained on the plates inoculated after 21 days showed a fourfold increase in resistance. Viable counts on the cultures containing 20 and 200 units per ml., when sampled on the 15th and the 4th days respectively, yielded no growth; neither did subsequent samples of these cultures.

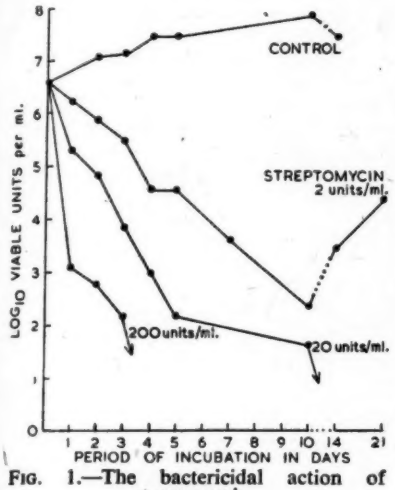

FIG. 1.—The bactericidal action of streptomycin.

Isoniazid.—The bactericidal action of isoniazid alone in concentrations of 0.2, 2, and 20 μg. per ml. is shown in Fig. 2. The number of viable units in the cultures was diminished by a thousandfold after contact with 0.2 μg. per ml. for five days, 2 μg. per ml. for two and a half days, and 20 μg. per ml. for two days. Thus, although the speed of the bactericidal action was slightly increased by higher concentrations of isoniazid, this effect was less marked than with streptomycin. It should be noted that there was about a tenfold decrease in the viable counts during the first 24 hours with all three concentrations of isoniazid. The viable count on the culture containing 0.2 μg. per ml. began to increase after the 13th day. Subculture on to Löwenstein slopes containing isoniazid concentrations showed that the organisms present were resistant, being capable of growth on 0.2 μg. per ml. but not on 1 μg. per ml., whereas H37Rv was inhibited by 0.2 μg. per ml. In a similar manner a resistant strain capable of growth on 50 μg. per ml. was obtained from the culture containing 2 μg. per ml. Viable counts on the culture containing 20 μg. per ml. yielded no growth on the 13th, 21st, and 27th days.

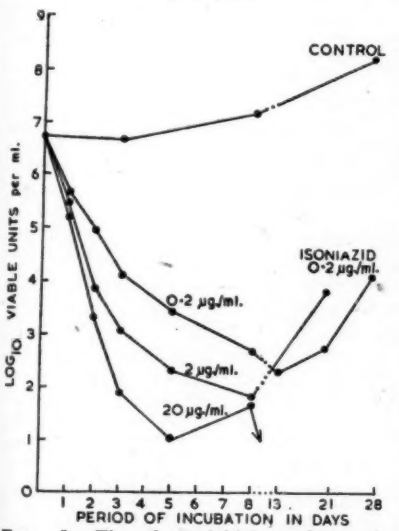

FIG. 2.—The bactericidal action of isoniazid.

Streptomycin Plus Isoniazid.—The bactericidal actions of streptomycin alone in concentrations of 2 and 20 units per ml., of isoniazid alone in concentrations of 0.2 and 2 μg. per ml., and of both drugs in combinations of these concentrations were tested simultaneously. The results are shown in Fig. 3. The bactericidal activity of isoniazid in concentrations of 0.2 and 2 μg. per ml. was about the same as that of 2 units of streptomycin per ml., but the activity of 20 units of streptomycin per ml. was distinctly greater. However, the combination of 0.2 μg. of isoniazid and 2 units of streptomycin per ml. was much more active than either alone, and was equal to or slightly greater than the activity of 20 units of streptomycin per ml. The combination of 2 μg. of isoniazid and 20 units of streptomycin per ml. was even more active, though the increase in bactericidal activity of this combination as the concentrations of the drugs were increased tenfold was less marked than with streptomycin alone.

Isoniazid-resistant strains capable of growth on Löwenstein slopes containing 50 μg. of isoniazid per ml. were eventually obtained from the cultures containing 0.2 and 2 μg. of isoniazid per ml. alone. The remaining cultures failed to yield growth in their viable counts and guinea-pigs injected with them failed to develop tuberculosis.

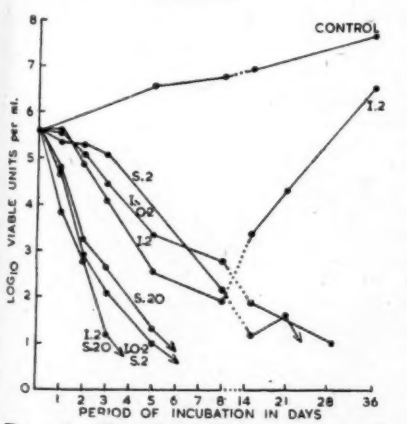

FIG. 3.—The bactericidal action of streptomycin and isoniazid alone and in combination. S.2 = Streptomycin 2 units per ml. S.20 = Streptomycin 20 units per ml. I.0.2 = Isoniazid 0.2 μg. per ml. I.2 = Isoniazid 2 μg. per ml. I.0.2, S.2 = Isoniazid 0.2 μg. plus streptomycin 2 units per ml. I.2, S.20 = Isoniazid 2 μg. plus streptomycin 20 units per ml.

Discussion

The streptomycin concentration of 20 units per ml. and the isoniazid concentration of 2 μg. per ml. are both about equal to maximum serum levels (Medical Research Council, 1948; Elmendorf *et al.*, 1952), and the two lower concentrations of 2 units of streptomycin per ml. and of 0.2 μg. of isoniazid per ml. are both four to eight times the maximal concentration that inhibits the growth of sensitive tubercle bacilli (Medical Research Council, 1948; Mitchison, 1952). Thus the concentrations that we have used can be regarded as equivalent for both drugs, and are about equal to maximal and minimal therapeutic serum levels.

At the maximal serum concentrations streptomycin was more rapidly bactericidal than isoniazid, though at the minimal levels there was little difference in their activity. The concentration of both drugs in tuberculous lesions would be less than the peak serum level, so that here the activity of both drugs would probably be nearly the same.

As shown in Fig. 2, and in two further unpublished experiments, isoniazid appeared to have caused a marked fall in the viable counts after 24 hours' contact. A similar fall in Fig. 3 was not shown, probably because the count at 0 days was unsatisfactory, being done on only one plate. Mackaness and Smith (1953) found a delay of 48 hours before the onset of any marked fall in their viable counts. The difference might be due either to the presence of smaller bacillary aggregates in our suspensions or to the organisms being in a different growth phase.

There was an increase in bactericidal activity as isoniazid concentration was increased, as shown in Figs. 2 and 3 and also found in a third unpublished experiment. We cannot account for this difference between our results and those of Mackaness and Smith, who found that the bactericidal effect of isoniazid was independent of the drug concentration. The increase in activity with increasing drug concentration was, however, more marked when streptomycin was used. One would therefore expect an increase in therapeutic dosage of streptomycin to be more beneficial to patients than a similar increase of dosage of isoniazid.

As shown in Fig. 3, the bactericidal activity of a combination of streptomycin and isoniazid at minimal therapeutic concentrations was as great as the activity of the maximal concentration of streptomycin alone, and the activity of maximal concentrations of both drugs together was greater than that of either alone. Thus one would expect treatment

of patients with a combination of streptomycin and isoniazid to be more effective than treatment with either drug alone, even in the early stages, when development of resistant strains of tubercle bacilli would probably not have occurred.

When either streptomycin or isoniazid alone was added to our cultures, in most experiments resistant strains eventually replaced the sensitive bacilli which had been killed. When the two drugs were added together resistant strains did not emerge. These results are analogous to the observation that a combination of streptomycin and isoniazid prevents or delays the development of resistant strains in pulmonary tuberculosis (Medical Research Council, 1953a).

Summary

At concentrations four to eight times those necessary to inhibit growth of tubercle bacilli the bactericidal activities of streptomycin and isoniazid were the same. At concentrations ten times higher, corresponding to maximal serum levels, the activity of streptomycin was greater than that of isoniazid. The activity of the combination of both drugs was higher than that of either alone, and prevented the growth of resistant strains of tubercle bacilli.

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PROGNOSIS OF DEPRESSION TREATED BY ELECTRIC CONVULSION THERAPY

BY

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Electric convulsion therapy (E.C.T.) is now widely used in psychiatric practice, and its efficiency, especially in the treatment of depressive states, would seem to be beyond dispute. It is certainly the commonest method of treatment employed by the in-patient psychiatric unit.

In England and Wales approximately 60,000 people are admitted to mental hospitals annually, and probably at least one-third have E.C.T. at some time during their stay; nor does this figure take into account the number who receive it as out-patients or in private practice.

It is therefore a matter of some importance that the long-term results of this treatment should be critically assessed. The present paper describes the position at the end of three years of a series of cases of depression treated in a mental hospital, the majority of which received E.C.T., and the effects of that treatment are evaluated.

Material and Method

The patients studied consisted of 114 "typical" cases of a series of 130, the clinical features of which have already been published (Jarvie, 1950). They represented the routine admissions to the Cheadle Royal Hospital of people suffering from depression who came under my care from May, 1947, to April, 1949. Of the 130 cases, 16 were regarded as "atypical" in that they showed unusual, bizarre, or schizophrenic features, and the diagnosis of "depressive state" would probably not have been accepted in their case by many psychiatrists. The results in this atypical group will be published elsewhere, as they are of more specialized interest.

The 114 cases were an entirely heterogeneous group of consecutive admissions and included cases which could have been placed in most of the recognized clinical subgroups—manic-depressive, involutional, anxiety-depressive, reactive. Their ages ranged from 21 to 78, but the majority (74) at the time of admission were 50 years of age or older. They included cases having both recurrent and first attacks. The age and sex distribution is shown in Table I. In view

TABLE I.—*Age and Sex Distribution of Cases Studied*

Group	No. of Cases	Sex		Age Group					
		M	F	20–29	30–39	40–49	50–59	60–69	70–79
No E.C.T. ..	17	9	8	2	—	2	4	7	2
E.C.T.—Recovered	71	28	43	2	7	16	23	21	2
,, Improved	26	12	14	—	6	5	7	6	2
Totals ..	114	49	65	4	13	23	34	34	6

of the difficulty that exists, except in extreme cases, of making a rigid differentiation of clinical types, it was felt it would be of little value to attempt an analysis of the effects of E.C.T. on different subgroups. Consequently the results presented here are those of the whole series without reference to diagnostic grouping.

The method of inquiry was as follows. On the third anniversary of the patient's discharge from hospital a questionary was sent to the nearest relative and to the patient's doctor. The information asked for was the same in both cases, except that the doctor was asked to give the certified cause if death had occurred. The purpose of the double questionary was to obtain a cross-check on the information received. From the results obtained in this way any further sources of information were followed up—for example, by inquiry to hospitals or consultants who had been concerned with the patient. The case-notes of the parent hospital also form a source of information when, as in many cases, the patients had returned for further in-patient or out-patient treatment.

Results

Of the 114 cases, 97 received a course of E.C.T., after which 71 (73%) were discharged recovered and 26 (27%) were discharged improved. The number of convulsions administered and the duration of stay in hospital (in weeks) are shown in Table II. The remaining 17 patients either did

TABLE II.—*Number of Convulsions and Duration of Stay in Hospital of Cases Receiving E.C.T.*

Group	No. of Convulsions			Stay in Hospital (Weeks)		
	Min.	Max.	Median	Min.	Max.	Median
Recovered ..	2	14	7	2	23	7
Improved ..	6	21	7·5	3	37	8

not receive E.C.T. or received such small amounts that it was regarded as not affecting the course of the illness. This last group is considered first.

Cases Not Receiving E.C.T.

In seven cases treatment with E.C.T. was withheld for physical reasons, all cardiovascular—atheroma, congestive cardiac failure, aortic aneurysm, aortic stenosis, cardiac syncope, and hypertension. In one other case the treatment was stopped after four convulsions, as the patient developed Stokes-Adams attacks during its administration. At the end of three years six of these eight patients were dead—

four from natural causes and two from suicide; one was a patient in another mental hospital, and one was well so far as the psychiatric illness was concerned.

Of the nine remaining cases which did not receive E.C.T. the following was the position at the end of three years: no information, 3; still in hospital, 1; completely well, 3; fairly well, 2.

E.C.T.—Cases Discharged Recovered

At the end of three years the position with regard to the 71 cases which received E.C.T. and were discharged recovered was as follows:

No adequate information	7 (10%)	
Dead	5 (7%)	
Well—Completely	25 (35%)	34 (48%)
Fairly*	9 (13%)	
Relapsed	25 (35%)	

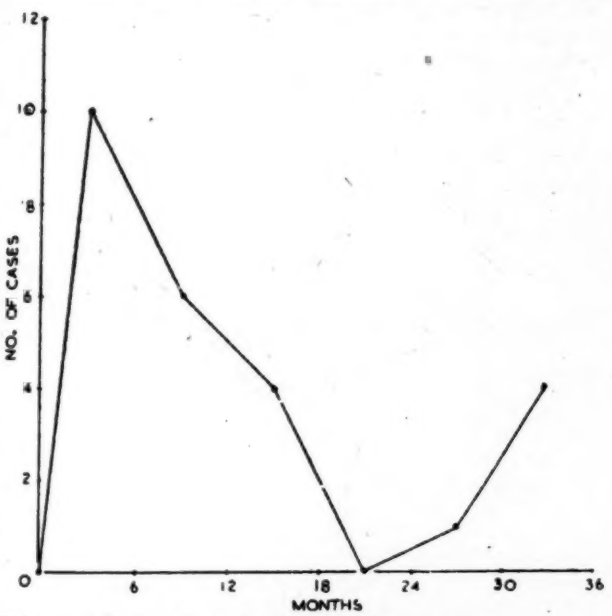
*Nine cases were regarded only as fairly well for the following reasons: (*a*) still on sedatives, 2; (*b*) failed to return to work, 1; (*c*) evidence of unstable episodes of short duration, usually of depression and/or elation, 6.

Of the five deaths, four were due to coronary artery thrombosis and one to lobar pneumonia.

Cases Relapsing

The interval (in months) between discharge and recurrence of symptoms is shown in the Chart. It is interesting to note that the relapses reached a peak within the first six months, then became less frequent, so that between 18 and 24 months none was recorded. From then onward the incidence of relapses began to rise again. This suggests that cases relapsing within 18 months of discharge are mainly true "relapses" of cases apparently well but really inadequately treated, while those whose symptoms recur later are having further genuine attacks.

Seven cases were still well after a further single course of treatment, in six consisting of more E.C.T. and in one



Interval between discharge from hospital and recurrence of symptoms in 25 cases which relapsed after being discharged recovered.

of symptomatic treatment with sedatives and euphoriant drugs. In all seven cases the recurrence of symptoms occurred within a year of discharge.

Four cases had broken down again just at the end of the three-year period and were under treatment in hospital at the time of inquiry.

One patient had been admitted to another hospital, where she still remains. In her case the symptoms recurred six weeks after discharge from the Cheadle Royal Hospital.

Of the remaining 13 cases, 12 had required further in-patient or out-patient supervision on two occasions: four of them had received one further course of E.C.T., and the remainder two further courses. Subsequently two of these cases had the operation of prefrontal leucotomy. Only one of these 12 cases was regarded as being well at the time of inquiry. The remaining patient had been readmitted to hospital on seven occasions within the three-year period and had received seven courses of E.C.T., consisting of a total of 39 convulsions.

E.C.T.—Cases Discharged Improved

Twenty-six cases were discharged only improved after what was regarded at the time as an adequate course of E.C.T. At the end of three years the position with regard to this group was as follows:

No adequate information	7 (27%)	
Dead	2 (7·7%)	
Well without further treatment	1	4 (15·4%)
Well after relapse treated with E.C.T.	3	
Still not symptom-free:		
In same condition as on discharge; no relapse, no more E.C.T.	6	10 (38·4%)
Still unwell after relapse treated with E.C.T.	4	
Prefrontal leucotomy	3 (11·6%)	

Of the two deaths, one was due to carcinoma of the colon and the other to a glioblastoma.

Physical Sequelae

Apart from the deaths and the one patient who developed epilepsy, organic sequelae which could even be remotely ascribed to the treatment were surprisingly few.

In this series the treatment had in every case been given *unmodified*—that is to say, without the aid of muscle relaxants or anaesthetics. In only one case was a definite fracture encountered during the administration of the treatment. This was in a lady of 65 who fractured her right humerus. Since then she has developed a painful swelling of both hands, presumably arthritic, although she had not been troubled with this before. It is of course difficult to decide how much these changes are due to the effects of the fracture or E.C.T. and how much to the natural processes of ageing.

Two patients complained of pain in the back which seemed to be genuinely organic in origin. Although minor degrees of compression fracture of the mid-dorsal vertebrae may have been missed, it is again difficult to decide without fuller investigation whether these complaints were not based on natural changes unconnected with the treatment.

Atlhough not specifically asked for in the questionaries, no complaints of persisting amnesia or other intellectual defect were recorded. Most of the patients in this series came from the Registrar-General's social classes I and II, and many have returned to work of considerable responsibility which they have carried on effectively and efficiently.

The deaths require some comment. Four of the seven were due to coronary artery thrombosis. Again it is difficult to implicate the treatment as an aetiological factor in precipitating death in these cases. One patient was known to have a pre-existing heart lesion, while the other three died at intervals of 3, 16, and 24 months after treatment. They were aged respectively 42, 61, and 66 at the time of death. It is not surprising that cases of unsuspected cardiovascular anomaly pass unnoticed in patients of the older age groups.

As has already been stated, the actual administration of E.C.T. in the crude and unmodified form gave rise to anxiety in only one case—namely, that of the lady in whom it was stopped because of the development of Stokes-Adams attacks during it. Even she managed to survive for two years after its administration.

The patient who developed a glioblastoma complained of symptoms two and a half years after discharge and died nine months later. The tumour, of considerable size, was found at necropsy in the temporal lobe.

One patient developed epilepsy. On discharge she was known to have received the largest number of convulsions—

a total of 60. Her case was complicated by the fact that a few weeks before her initial treatment with E.C.T. she appeared to be recovering from some infection involving the nervous system, as the following case history shows. There was no family history of epilepsy in her case.

A woman of 27 was admitted to the Cheadle Royal Hospital in November, 1942, suffering from melancholic stupor. She remained a patient until the early part of 1944. During this time she received 54 convulsions. Two months before admission she was reported to have had "catarrhal jaundice," and on admission she had nystagmus and bilateral extensor plantar responses. A lumbar puncture produced a clear fluid with 64 cells per c.mm., lymphocytes predominating, and a raised protein. Blood and C.S.F. Wassermann reactions were negative. Six months later the C.S.F. was normal, and when she was examined on readmission in 1947 there were no persisting neurological signs. A further course of six convulsions was given, and 21 months later she had her first grand mal attack.

Discussion

This study confirms the value of E.C.T. as a therapeutic agent in the treatment of depression.

It has to be remembered that most of the cases in this series were severely ill, otherwise mental hospital treatment would not have been regarded as necessary. Many on admission to hospital were calculated suicidal risks, and several had made an active attempt at suicide before admission. In the 71 cases discharged recovered after a course of E.C.T., 15 (21%) had made such an attempt, while in the 26 cases discharged improved 9 (34.6%) had done so. Only two attempts at suicide, both unsuccessful, were reported in the available follow-up material of these 97 cases.

On the grounds of suicidal risk alone, therefore, treatment with E.C.T. can be said to have returned many socially useful people to a happy and effective life much more quickly than would have been the case if a natural remission had been awaited. Nevertheless, the limitations of the treatment must be recognized. In the first place, although the number of cases of depression which make a good initial response to E.C.T. is high (73%), every case does not respond completely, although on the whole nearly all of them show sufficient response to be regarded as improved. Secondly, a high proportion (35%) of cases discharged recovered relapse within the relatively short period of three years. Many of these cases are true "relapses" in that they represent the recurrence of symptoms in an attack which has been inadequately treated and in which superficial improvement has been regarded as recovery. Several of these cases respond to a further single period of supervision (on the average, of 10 weeks' duration) and an additional course of E.C.T. (on the average, eight more convulsions).

In any unselected group of depressions treated with E.C.T. there will be a hard core of cases in which the administration of this form of treatment will be of only limited value. These cases will consist of two main groups—those which fail to produce more than a minimal response to E.C.T. although apparently adequately treated, and those which seem to respond to E.C.T. but which relapse after a short time and continue to relapse at intervals, in spite of further courses of E.C.T. Thus one woman in the series had received a total of 39 further treatments and had been readmitted to hospital on seven occasions during the three-year period. In the 10 years which had passed since her first attack she had a total of 11 admissions to hospital and was known to have had 65 convulsions.

In chronic relapsing cases of this nature, with decreasing intervals of well-being, it is obvious that the continued administration of E.C.T. can hardly be justified. In such cases cerebral surgery must be seriously considered as an alternative form of treatment, and the good but limited response to E.C.T. which these cases show gives the measure of probable success. The reasons why a number of cases of depression should make only a limited initial response to E.C.T., so that they can be regarded as having improved rather than recovered, are obscure and probably complex. While a few of the 26 cases discharged improved were probably inadequately treated, reasons other than this must be adduced to explain the failure of response in the remainder. From the study of this group there was some evidence that many were people of poor personality caught up in serious personal difficulties.

In spite of the fact that the mode of action of E.C.T. is apparently physiological, it is important that we should not get too far away from the concept of depression as a dynamically orientated illness.

The assessment of any form of treatment must be made against the background of the natural history of the illness. It should therefore be remembered that depression is a self-limiting disease, and patients often come for treatment when the brunt of the illness is over. Nevertheless, the response of most cases of depression to E.C.T. is rapid and effective and can be observed after the first few convulsions.

On the whole, E.C.T. is an effective form of treatment for the majority of cases of depression uncomplicated by serious physical disease, although its limitations in 30–40% of cases should be recognized. Physically, it is fairly innocuous, and apart from traumatic events in the course of its administration and the occasional disturbing cardiac episode, it is very safe. These events should be materially reduced by the administration of the treatment in the modified form. The only serious complication would appear to be epilepsy, and this cannot be a common one. It does not occur unless large numbers of convulsions are administered (Sundqvist, 1951). On the whole, for this and other reasons, the continued administration of E.C.T. as a therapeutic agent in any one case over a long period of time is undesirable.

Summary

The results of a three-year follow-up study of 114 cases of depression treated in a mental hospital are reported.

Ninety-seven cases were given E.C.T., and the immediate and remote results of this treatment are analysed.

It is concluded that E.C.T. is an effective form of treatment in most cases of depression, but its limitations in some 30–40% of cases should be recognized.

Physically, it is an innocuous form of treatment, but one serious complication reported is epilepsy.

I am indebted to Dr. J. A. C. Roy for enabling this study to be made. I am grateful to Miss Joan Williams, medical records secretary at Cheadle Royal Hospital, for her willing co-operation in issuing questionaries and collecting information, and to Dr. W. Ritchie Russell for much helpful criticism in the presentation of this material.

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New regulations made under the National Insurance (Industrial Injuries) Acts by the Minister of Pensions and National Insurance extend the insurance cover against pneumoconiosis. The regulations, which came into operation on January 11, give effect to recommendations made by the Industrial Injuries Advisory Council in their report on pneumoconiosis (Cmd. 8866). Up till now benefit for pneumoconiosis has been available only to persons who since July 5, 1948, have worked in occupations which have been scheduled because they are known to be capable of giving rise to the disease. Under the new regulations benefit is also available to persons who have never worked in a scheduled occupation but who are suffering from pneumoconiosis due to the nature of their work since July 5, 1948, in some other dusty occupation. Before being referred to the pneumoconiosis medical panels, claimants from unscheduled occupations will be required to provide a medical certificate or similar evidence to show that there is a reasonable cause for suspecting they are suffering from pneumoconiosis. Those who are totally disabled by pneumoconiosis but whose period of exposure ended before July 5, 1948, may be entitled to an allowance under the Pneumoconiosis and Byssinosis Benefit Scheme, 1952.

MUCOCELE OF THE APPENDIX

BY

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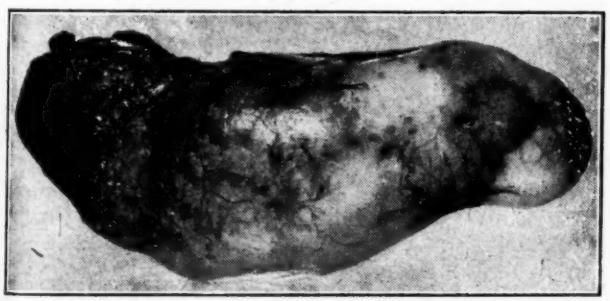
Mucocele of the appendix is an uncommon condition. Woodruff and McDonald (1940) reported its incidence as 0.3% of appendicectomies in the Mayo Clinic over a period of 24 years. The disease was described by Rokitansky in 1842 and by Virchow in 1863. Werth in 1884 first described pseudomyxoma peritonei associated with cystadenoma of the ovary, and in 1901 Fraenkel recorded the same condition in a case of appendix mucocele.

Case 1

A man aged 76 was admitted to hospital in October, 1952, complaining that for 24 hours the rupture in his right groin had been painful and irreducible and that he had been vomiting. There were the typical signs of a strangulated right inguinal hernia, but rectal examination revealed the presence of a large firm swelling in the rectovesical pouch. At operation the hernial sac was found to contain strangulated but viable small intestine. The bowel was reduced and the abdomen explored by a finger inserted through the neck of the sac. A firm smooth mass, which was palpable, extended from the right iliac fossa into the pelvis. The peritoneal cavity was opened through a transverse incision above the inguinal canal, disclosing the mass, which proved to be a large mucocele of the appendix. It was delivered with some difficulty, as it was adherent to its surroundings, and was removed. The hernia was repaired and the incision closed. On subsequent questioning the patient denied any history of previous abdominal pain or dyspepsia. He collapsed and died suddenly of a coronary thrombosis on the fourth day after operation.

The appendix (see illustration) measured 6¼ in. (15.8 cm.) in length and 7½ in. (19 cm.) in its greatest circumference. It contained a colourless jelly-like substance, and the lumen



Photograph of the appendix in Case 1.

was completely occluded at the base by a short fibrous stricture. Histological examination showed that the wall was only 1/16 in. (1.6 mm.) thick. The serous coat was normal, but the muscle was entirely replaced by hyaline connective tissue with many cholesterol clefts. The lining epithelium consisted of a single layer of tall columnar cells secreting mucus.

Case 2

A woman aged 38 was admitted to hospital in June, 1951, with a history of central abdominal pain and vomiting of four days' duration and more recent pain in the right iliac fossa. The temperature was 100.2° F. (37.9° C.) and the pulse rate 90 a minute. There were tenderness and muscle guarding in the right iliac fossa and hypogastrium; rectal examination revealed tenderness of the pelvic peritoneum but no palpable tumour. The pre-operative diagnosis was appendicitis with perforation and peritonitis. At operation thin pus was found in the peritoneal cavity. The appendix was much enlarged and was surrounded by mucoid material, which was also present in the pelvis. The left ovary contained a small cyst. Appendicectomy was performed and the abdomen drained. Recovery was uneventful. Section of the specimen showed that a pre-existing mucocele of the appendix had become acutely inflamed and had ruptured.

In September, 1952, 15 months after appendicectomy, the patient was readmitted complaining of swelling of the abdomen which had been progressing for nine months. On examination there was a central cystic tumour in the hypogastrium extending from the pubis to the umbilicus. Pelvic examination revealed that the uterus was of normal size; the large cyst was palpable through the left anterior fornix, and a smaller cyst was found in the right appendage. At operation the peritoneal cavity contained large quantities of mucoid substance which was exuding from a perforation of a multilocular cyst of the left ovary. The right ovary contained an endometrial cyst. Bilateral salpingo-oophorectomy was carried out. Histological examination showed that the large ovarian cyst was a pseudomucinous cystadenoma. Subsequently radiotherapy was applied to the abdomen.

Discussion

The essential factors in the development of appendix mucocele are obstruction of the lumen and sterility of its contents. In most cases the obstructing agent is a fibrous stricture at the base of the appendix which completely occludes the lumen and is the result of former appendicitis. On occasion the lumen is narrowed but not totally obliterated, since a mucocele may fill with barium in the course of an opaque-meal examination (Vorhaus, 1930). Wilson (1950) estimated the degree of occlusion necessary for the formation of appendiceal diverticula and found that an internal circumference of 4 mm. was the critical level at which obstruction and retention of secretions occurred. Wangensteen *et al.* (1937) recorded a resistance to the flow into the caecum of fluids injected into an appendicostomy and suggested the possibility of functional obstruction due to a sphincter mechanism at the appendix base. Carcinoid tumour (Topping, 1937), carcinoma of the caecum (Muir, 1931), and endometriosis (Shemilt, 1949) are rare causes of the condition.

The appendix contains a jelly-like material, pseudomucin, which is a glucoprotein distinguishable from mucin by reduction tests and by staining with mucicarmine. Its presence may be due to abnormal secretion by the mucosa or, since all gradations of staining and reduction reactions occur, the change from mucin to pseudomucin may be a gradual extracellular one. The content of a mucocele is usually sterile on culture. Wells (1936) produced the condition in rabbits by ligation of the appendix base, leaving the blood supply intact. In the experiments of Cheng (1949) and Grodinsky and Rubnitz (1941), however, simple ligation resulted in acute appendicitis, and development of mucocele required preliminary sterilization of the lumen by irrigation with saline, penicillin, or sulphaguanidine solutions. In long-standing cases the pseudomucin becomes inspissated, and calcification may lead to the formation of a large appendiceal calculus (Bunch, 1945).

In experimental mucoceles the muscular coat is hypertrophied in the early stages, but in the fully developed condition the muscle is thin and almost, or entirely, replaced by fibrous tissue, which may become hyalinized and eventually calcified. Diverticulum formation is common and is probably an early occurrence, as Wilson (1950) has shown that an actively contractile muscularis is essential to raise the intra-appendicular pressure and that passive distension of the appendix is ineffective.

Pseudomyxoma peritonei, which also follows rupture of a pseudomucinous cyst of the ovary, is the most important complication of appendix mucocele and is characterized by the presence of masses of colloid in the peritoneal cavity either lying free or enclosed in membranous adhesions. This material is identical with the contents of the mucocele and may be localized to the region of the appendix or widespread. The initial cause of the condition is perfora-

tion of the appendix, usually through a diverticulum, but the large quantities of pseudomucin which may be found have led to speculation concerning its origin. There are three possibilities.

1. The serosal cells may be stimulated by the presence of colloid to secrete an identical substance. This seems unlikely. Trotter (1910) stated that the peritoneal lining cells could assume columnar forms but believed that their reaction was of the nature of a foreign-body peritonitis and limited to the formation of enclosing adhesions.

2. The peritoneal pseudomucin may result from its continued discharge from a perforation of the mucocele, but if this were so the complication would be halted by removal of the appendix. It may, however, recur after appendicectomy and eventually lead to the death of the patient.

3. The most probable explanation, in both appendiceal and ovarian types, is that mucus-secreting cells escape into the peritoneal cavity and, becoming implanted there, continue to secrete. Such cellular elements are difficult to find histologically in the peritoneal colloid, but the hypothesis is supported by the experiments of Grodinsky and Rubnitz (1941), who injected the contents of mucoceles into the peritoneal cavities of other animals and produced progressive pseudomyxoma peritonei, while if the contents were first passed through a Seitz filter to remove the cells the condition did not develop.

Woodruff and McDonald (1940), in a study of 146 cases, divided appendix mucocele into two groups. In the first the mucosa consists of a single layer of columnar cells. Rupture of such a mucocele leads to a localized type of pseudomyxoma peritonei which does not recur after appendicectomy. In the second, smaller group the mucosa is hyperplastic owing to the presence of papillae covered with large columnar cells containing hyperchromatic nuclei. This is regarded as a grade 1 adenocarcinoma, and perforation causes dissemination of malignant cells and a diffuse, progressive peritoneal lesion.

Pseudomyxoma peritonei of appendiceal or ovarian origin differs, therefore, only in degree of malignancy from the coelomic spread of colloid carcinoma of the alimentary tract.

The occurrence of mucocele of the appendix and pseudomucinous ovarian cyst in the same individual has been recorded many times. Bailey (1916) and Ries (1924) described cases with both lesions present simultaneously and discharging colloid into the peritoneal cavity. In Eden's (1912) patient an appendix mucocele was found two years after operation for a ruptured pseudomucinous cyst. The double condition is usually complicated by pseudomyxoma peritonei, and it is likely that one lesion results from transcoelomic implantation of mucus-secreting cells released by perforation of the other, although the reason for selective involvement of these viscera alone is not clear. Willis (1952) considers that the probable sequence is rupture of a primary ovarian cyst which causes colloid and cellular spread in the subserous tissues and thus involves the appendix leading to mucocele. In Case 2, however, the perforated appendix preceded the large ovarian cyst, although a small cyst was noted at the first operation. Hentz (1932) recorded a case with both lesions but without peritoneal colloid, and suggested that cells passed from the ovary to the appendix by lymphatic channels.

Other complications of appendix mucocele are acute inflammation (Case 2), intussusception (Ward-McQuaid, 1949), volvulus (Jones and Carmody, 1936), and occurrence in a hernial sac (Juvara and Borcescu, 1948).

The clinical features of uncomplicated mucocele are vague and symptoms are often absent. There may be a history of recurring pain in the right iliac fossa and a mass may be palpable in the abdomen or the pelvis. Radiology may show calcification of the appendix wall or of its contents, or a soft-tissue shadow displacing the caecum or producing a filling defect may be visible with an opaque meal. Rarely does the mucocele fill with barium.

The treatment is appendicectomy; in the female, especially when the mucocele is perforated, the ovaries are examined for concomitant pseudomucinous cyst. Occasionally the dense adhesions of the appendix necessitate resection of bowel for its removal. When the complication of pseudomyxoma peritonei is present the myxomatous material is removed so far as possible, and post-operative radiotherapy to the abdomen is carried out in an attempt to destroy the disseminated mucus-secreting cells. Drainage of the peritoneal cavity is avoided because of the tendency to secondary infection. A more accurate prognosis may be given in such cases if the appendix mucosa is examined for the presence or absence of papillomatous formations.

Summary

Two cases of mucocele of the appendix are described, one of them associated with pseudomyxoma peritonei and with pseudomucinous cyst of the ovary. The pathogenesis, complications, and clinical features of the condition are discussed.

I am grateful to Mr. W. M. Beattie and Mr. C. H. Walsh for permission to record Case 2; to Dr. J. Carr Brundret for the histological reports; and to Mr. J. Cosbie Ross for advice in the preparation of this paper. I have to thank the central photographic department of the University of Liverpool for the photograph.

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A CASE OF ULCERATING HODGKIN'S DISEASE

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The ulcerative form of Hodgkin's disease is so rare and so difficult to diagnose that the following case is worthy of record.

Case Report

A woman aged 44 was admitted to St. Luke's Hospital, Bradford, in July, 1948, complaining of a painful swelling on the anterior chest wall, over her sternum, of twelve months' duration. The swelling had gradually become larger, recently fluctuant, and had been aspirated two weeks before admission. She also complained of painful stiffness of the neck for about three years, and aching of both arms for twelve months. The spleen was not palpable and no glands were enlarged. The E.S.R. was 18 mm. in one hour; haemoglobin, 85%; W.B.C., 16,000 per c.mm. (polymorphs 83%, lymphocytes 12%, monocytes 5%); platelets normal. The Wassermann reaction and Kahn test were negative on two occasions. *X*-ray examination showed erosion of the left sternoclavicular joint and adjacent sternum, with no new bone formation.

The fluctuant swelling was incised, pus and necrotic bone were curetted out, and the wound was closed. The wound healed by first intention. The pus obtained was sterile on culture and no organisms were found in the smear. A provisional diagnosis of a tuberculous lesion was made, and the patient was discharged home four weeks later, to await a bed at a sanatorium.

In March, 1949, she was readmitted from the sanatorium with the abscess from the sternum increasing in size and pointing in two places. Incision with curettage was performed, a large quantity of necrotic debris being evacuated. The appearance favoured the diagnosis of gumma, despite the negative Wassermann reaction and Kahn test. Examination of the pus again showed no tubercle bacilli or other organisms, and section of the curettings of the ulcer wall revealed necrotic tissue. A consultant venereologist diagnosed the ulcer as gummatous in nature despite the absence of other signs of syphilis. He gave a course of bismuth, penicillin, arsenicals, and iodides with no response. She was discharged home in April, and kept under out-patient surveillance.

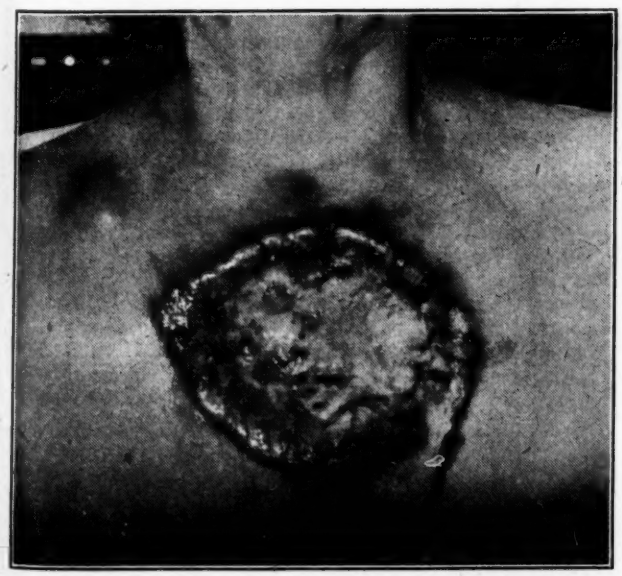
In July she was readmitted as an emergency case following haemorrhage from the abscess, the cavity being packed to control it. Repeated examination of the pus showed no evidence of tubercle bacilli or actinomycosis. Guinea-pig inoculation was negative. No glands were palpable elsewhere in the body.

In August the swelling over the sternum had developed into a large ulcer, approximately 1 in. (2.5 cm.) in depth and 5 in. (12.5 cm.) in diameter, with an elevated edge and an uneven floor covered with necrotic granulations. A biopsy of the edge of the ulcer was taken, and the section report was as follows: "The histological picture is that of a chronic granulomatous lesion probably tuberculous in origin. The caseous material consists of degenerate cells with mucus and a few pus cells. No tubercle bacilli or other organism seen." The lesion was still thought to be tuberculous in nature.

Until June, 1951, progress was uneventful and the ulcer showed no change. She was then readmitted again for treatment of further haemorrhage from the ulcer. A recent swelling was found to be present below the right clavicle and a few discrete glands were palpable in the neck. This was the first appearance of glandular enlargement. No other glands were palpable and the spleen was not enlarged. A biopsy of one of the cervical glands was carried out, the pathological report on the gland being as follows: "Histological section shows marked fibrosis and complete loss of architecture. There is a proliferation of reticulum cells with several multinucleated cells and many eosinophils. The findings are in keeping with Hodgkin's disease."

In July an abscess was forming over the inner end of the right clavicle (see illustration). The patient was seen by Dr. Chester-Williams and transferred to the Radium Institute for a course of deep *x*-ray therapy.

In September the course had been completed and she showed a remarkable change; she had gained over 56 lb. (25.4 kg.) in weight, but her pain was still troublesome. The ulcer had shrunk considerably in size, and in October this improvement had been maintained. *X*-ray examination of the cervical and dorsal spine showed no abnormality, but both clavicles showed absorption at their medial ends. The mediastinum was within normal limits, but the anterior ends of both first ribs were absorbed and showed no evidence of regeneration. Three months later the ulcer had practically healed.



Showing the ulcer over the sternum, with an abscess forming over the right clavicle.

In April, 1952, there was considerable local improvement, but she had severe pain over the fourth dorsal spine. Some supraclavicular infiltration was present, and her general condition was failing.

In October she had a painful swelling in both posterior triangles of her neck. The lower edge of the ulcer was extending, with a painful swelling over the lower end of the sternum. In November she had further subcutaneous swelling on the right chest wall and some loss of power in the right arm, with considerable induration in the supraclavicular regions.

In April, 1953, she attended for her eighth course of deep *x*-ray therapy. The ulcer had broken down again and was 1¼ by 2¼ in. (3.8 by 6.4 cm.) in size. There was a large soft swelling to the right of the ulcer and two smaller swellings on the left side and over the lower end of the sternum. Her general condition was deteriorating, and in the past year she had lost 35 lb. (15.9 kg.) in weight.

Discussion

The first observation of an ulcerative lesion in Hodgkin's disease was reported by Grosz (1906), and in the following 21 years only 26 cases had been recorded. Price (1946) states: "The skin is only rarely involved; and when it is, or when, with equal rarity, the nodes undergo caseation or suppuration, this is due to the secondary infection by pyogenic organisms or by tubercle."

The difficulty of diagnosis is emphasized by a perusal of various case reports (Alderson, 1917; Cole, 1917; Kierland and Montgomery, 1941). Goldman (1940), in an analysis of 212 cases of Hodgkin's disease, did not mention the presence of ulcerating lesions. Senear and Caro (1937) comment that ulceration occurs in three different ways: (1) Ulceration of limited extent developing in a number of small nodules in the skin. (2) Extensive ulceration developing in the skin by extension from underlying involvement of lymph nodes, bones, and other tissues. The case recorded seems to be from this group. (3) Extensive ulceration developing in large infiltrations appearing in the skin without involvement of the underlying structures.

The ulcer may appear before obvious glandular involvement elsewhere, as in the case now recorded, and may cause considerable confusion in differential diagnosis. The differential diagnosis is between gumma, epithelioma, sarcoma, tuberculosis, and mycosis fungoides. The typical ulcerative lesion of Hodgkin's disease has sharply defined rounded borders, but may be irregular, serpiginous, or linear. The edge is elevated and the margins are undermined or sharply punched out to resemble a gumma. Usually, as in this case, the ulcer is deep, with an uneven floor, covered with abundant purulent necrotic material or granulation tissue which bleeds freely when touched. Pain is variable, but in this case was severe. Affection of the neck, thorax, and axillary regions is most common, but the condition can be widespread.

The diagnosis is usually made by biopsy, but the case described illustrates that this is not infallible, and is dependent on demonstration of the characteristic Dorothy Reed or Sternberg cell.

Radiotherapy, as in this case, makes the ulcer melt away (Moriame, 1949), but recurrence is usual.

Summary

A case of the rare ulcerative type of Hodgkin's disease is described, illustrating the extreme difficulty experienced in diagnosing this atypical form of the disease.

My thanks are due to Mr. A. Naylor for his encouragement and advice, and to Dr. F. E. Chester-Williams for permission to record this case.

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Medical Memorandum

Renal Complications after Using Sulpenin

Combinations of penicillin and sulphonamides have been in clinical use for more than a year. No serious toxic effects have been reported, and the manufacturers know of only a few mild reactions occurring in a small number of instances. The following case report seems to be the first example of a serious toxic effect following the use of "sulpenin."

CASE REPORT

A married woman aged 73 was admitted to hospital on March 7, 1953, with the following history. In the previous ten days she had had "influenza," and mild bronchopneumonia, for which her doctor had prescribed sulpenin, the total amount given before admission being 28 tablets (14 g. sulphonamide). Twenty-four hours before admission she had suddenly developed epigastric pain, which had increased in intensity. It "spread through to the back," but did not radiate to the shoulders. The character of the pain was described as severe, with exacerbations. She had never had anything like this previously. Several times in the previous 24 hours she had vomited a small amount of mucoid fluid. Throughout this period she noticed a diminution in the quantity of urine passed, and what was voided was bloody (she admitted that she had not been drinking very much for the past two days). She had been constipated for five days. In 1916 laparotomy and appendicectomy had been performed, and in 1917 gastric ulcer had been diagnosed radiologically.

On examination she had the appearance of an ill, moderately dehydrated old lady. The tongue was dry and brown. The neck and chest, cardiovascular system, and central nervous system were all normal. Her blood pressure was 160/90 mm. Hg, pulse rate 80, temperature 99° F. (37.2° C.), and respirations 22. In the abdomen there was an upper right paramedian healed scar. Muscular movements were diminished, tenderness was acute in the epigastric area, but not in either loin, bowel sounds were diminished, no mass or abnormal viscus was palpated, and no fluid was detected. Rectal examination was normal. A straight *x*-ray film of the abdomen did not show air under the diaphragm or any intestinal abnormality. A diagnosis of anuria due to sulphonamide intoxication was made.

On March 8 the cystoscopy findings were: residual urine in the bladder 3½ oz. (100 ml.); some trigonitis; right ureteric orifice oedematous and blocked with bloody material, no efflux being present; left ureteric orifice oedematous without efflux. Attempted catheterization of the right ureter failed. There was a block 1.5 cm. from the vesical opening. A left ureteric catheter passed easily and was left *in situ*.

An indwelling gastric tube was left *in situ* for 24 hours, but yielded practically no material on aspiration. She was given oral fluids, 1 oz. (28 ml.) hourly for 12 hours, after which time the amount was doubled each 12 hours; 500 ml. of M/6 sodium lactate was administered intravenously. After the cystoscopy no urine was passed for 17 hours, at which time spontaneous diuresis took place. (The left ureteric catheter was left *in situ* for 72 hours, but no urine drained through it.) In the next 24 hours she passed 35 oz. (1 litre) of urine. She was discharged on March 13.

Investigations.—March 7: microscopy of urine removed from bladder on cystoscopy revealed it to be acid in reaction, with a microscopic haematuria. No sulphonamide crystals were seen. March 9: urine turbid, red-brown, *p*H 6.2; deposit abundant red blood cells, with no excess of leucocytes and no crystals seen; alkaline reserve, 40.4 vols. CO_2%. March 11: urine deep red, *p*H 5.6; still large numbers of red blood cells. On March 13 the report was similar. Intravenous pyelography showed good function on both sides, with normal renal outlines. The concentration of dye excreted was better on the left than on the right.

COMMENT

The simultaneous administration of two antibacterial agents is now an accepted principle of therapeutics. The drugs employed are many, proceeding from mixtures of synthetic agents, such as sulphonamides, to mixtures of sulphonamides with various antibiotics. Sulpenin is one of these; each tablet contains penicillin, 100.000 units, sulphadiazine, 0.25 g., and sulphamerazine, 0.25 g. The dose administered for infection of average severity is two tablets every four hours.

Garrod (1953) outlined the principles and the problems of this kind of therapy. He gives the following indications for its use: prevention of acquired resistance, achievement of synergism, prevention of toxic effects, mixed and double infections, and, rarely, the urgent undiagnosed case. The main difficulty is to avoid the production of resistant strains of infecting organism, but penicillin–sulphonamide mixtures tend to do this much less often than do other combinations.

This case emphasizes the fact that combinations of antibacterial agents do not abolish the capacity of the individual drugs to produce their specific toxic actions on the host. It seems likely that sulphadiazine was probably the responsible fraction, as its solubility in urine of *p*H 6–6.5 is less than half that of a comparable dose of sulphamerazine at that *p*H. Recent work has cast some doubt on the routine use of sulphonamide mixtures alone. Weinstein and Murphy (1952) state "that combinations of sulphonamides may have little clinical usefulness in many instances, since they are often not as effective as the single agents which compose them." This raises the question of what sulphonamide is best combined with penicillin. Of the sulphonamide preparations now available, sulphasomidine (6 (*p*-aminobenzenesulphonamido)-2 : 4-dimethylpyrimidine), the isomer of sulphadimidine, would seem to be worth combining with penicillin. It has a greater solubility in acid urine than any other sulphonamide, the degree of acetylation is only 10–15%, the blood level remains consistently high, and side-effects are slight.

The clinical picture was not entirely typical in that no signs or symptoms referable to the loins were obtainable; a superficial examination suggested the presence of an intra-abdominal condition. A careful history provided the answer.

In the treatment—carried out along standard lines—it is significant to note that return of renal function occurred first on the non-catheterized side. Although the condition was what is often classified as an obstructive type of anuria, spontaneous diuresis occurred within 24 hours. The left ureteric catheter, *in situ* for 72 hours, did not drain urine in that period. It is possible that traumatic oedema of the ureteric mucosa, already partly damaged by a saturated solution of sulphonamide, was the cause of this depression of function. This experience would tend to support the view of those who recommend, after an initial cystoscopy, the application of the principles of the Bull regime to cases of sulphonamide anuria.

This case was under the care of Mr. Cameron MacLeod, to whom I am indebted for permission to publish.

J. G. CALLANAN, F.R.C.S.

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Reviews

SURGERY IN WARTIME

Surgery: History of the Second World War. Edited by Sir Zachary Cope, B.A., M.D., M.S., F.R.C.S. United Kingdom Medical Series, compiled under the direction of an Inter-Services Editorial Board. Editor-in-Chief: Sir Arthur S. MacNalty, K.C.B., M.D., F.R.C.P., F.R.C.S. who has written the Foreword for this volume. (Pp. 772; illustrated. 80s.) London: Her Majesty's Stationery Office. 1953.

This volume must surely be one of the greatest records of all time of the art of healing. It is far more than a mere record of surgical skill. It is the story of how a whole nation came to the help of those who had risked their lives in its service, of medical skill without parallel, devoted to those whose courage has never been surpassed. A fortunate combination of circumstances, rapid transport, blood transfusion, penicillin, gave the surgeon opportunities he never before possessed, but without the willing co-operation of the whole nation the amazing results he obtained could never have been achieved.

The volume opens with an admirable review by Ogilvie of the novel problems of the war and of the novel means by which they were overcome, and this is followed by a chapter on the general treatment of war wounds, dealing especially with the difficult conditions imposed. Lionel Whitby contributes a chapter on blood transfusion, in which he rightly claims that in no previous war has there ever been such a system, where blood was collected from thousands of healthy donors, kept in store, processed, and dispatched all over the world wherever it might be needed. And never before has there been produced such a balance sheet as he here presents of the origin, destination, and achievement of pints of blood from more than 750,000 donors. Largely to those donors did our wounded owe the 80 to 90% chance of life which they enjoyed.

In a great book the greatest chapter of all is that on abdominal injuries. It could have been written only by Gordon-Taylor. The width of outlook, the grasp of detail, the clarity with which he paints a most complex scene, demanded a depth of experience and a breadth of travel, and perhaps a classical background, which no one else possesses. He traces the story from the early days when morphine was the only resource to the splendid achievement of later years, when among over 5,000 abdominal casualties in the B.L.A., from June, 1944, to the armistice, recovery was obtained in 70%. It was not the achievement of any individual or of any one group, but of team work to which there is no parallel, covering transport, surgical technique, anaesthesia, chemotherapy, nursing, evacuation, and rehabilitation. From the purely surgical standpoint the chapter is packed with information of vital importance to all who have to deal with abdominal injuries of any kind, many indeed of the cases arising in air raids in this country.

The chapter on the treatment of burns by Zachary Cope and Morley is of high value and may well be accepted as expressing standard practice for years to come. It is very naturally followed by a discussion by Harold Gillies and his colleagues on plastic surgery and the organization of plastic units. The article by Kelsey Fry on maxillo-facial injuries gives a wonderful demonstration of what can be done in conditions which not long ago would have been regarded with utter despair.

We have been able to touch upon only a few of the highlights in a book whose every page is full of interest. It deserves the close study of every surgeon in the country, and perhaps especially of those of the younger generation, that they may realize how difficulties which appear insuperable may be overcome by determination and co-operation. And in the last chapter of all, where Julian Taylor tells of how he and his colleagues carried on their work in the Japanese prison camp of Singapore, they may learn something of the great ideals which have inspired our profession since the days of Hippocrates.

HENRY SOUTTAR.

CHEMICAL PATHOLOGY

Clinical Chemical Pathology. By Professor C. H. Gray, D.Sc., M.D., M.R.C.P., M.R.C.S., F.R.I.C. (Pp. 138. 10s. 6d.) London: Edward Arnold and Co. 1953.

This is the best book I have met on chemical pathology for students. It is neither a mere collection of diagnostic tips and laboratory techniques nor a treatise in which a student cannot see the wood for the trees. The range covered is rather limited—renal function, acid–base balance, fluid balance (two chapters), liver function, blood sugar, calcification, digestion and absorption of fat, the chemical pathology of the alimentary tract, endocrine disease, and miscellanea.

The first four chapters are particularly good. The chapter on blood sugar is the least satisfactory; Professor Gray may be prudent in avoiding discussion of the fundamental nature of diabetes, but surely it is not wise to recommend Soskin and Levene for further reading without some antidote. The laboratory techniques given are not more than are needed by students who do not propose to take up laboratory work. A table of normal values of blood constituents is given.

J. R. MARRACK.

CLINICAL ALLERGY

Clinical Allergy. By French K. Hansel, M.D., M.S. (Pp. 1,005; 86 illustrations and 3 colour plates. £6 10s.) London: Henry Kimpton. 1953.

This massive volume is presented as a complete text on the subject of general allergy and has been expanded from the author's previous work on allergy of the nose and paranasal sinuses published in 1936. Some eleven chapters are largely devoted to this subject, three to hay-fever, two to bronchial asthma, and five to allergy in children. The chapter on antihistamines is rather disappointing, and of its 16 pages almost half are occupied with the effect of antihistamines on the common cold. The chapter on A.C.T.H. and cortisone gives an adequate review of the subject.

No obvious omissions were found, and the text fulfils its aim of completeness. Unfortunately, a number of methods of treatment are stressed and recommended to which few, if any, allergists in Britain would subscribe and which are not considered normal practice in other countries. Thus, the author recommends small desensitizing doses rather than the usual progressive dosage found best in hay-fever in most hands. Perhaps that is why he finds (p. 516) that "treatment has not modified . . . the skin reactions." In Britain we expect the skin reactions to be greatly diminished or to disappear after adequate specific high-dosage therapy. The author also recommends sublingual antigen therapy and lauds the non-specific use of staphylococcus toxoid in urticaria, angioneurotic oedema, and eczema. In the presence of these unorthodox recommendations, the book may be considered an excellent reference volume for the expert rather than a text for the beginner in allergy. The general format and printing are superb and no typographical errors were observed. The bibliography and index are satisfactory features of the book.

C. J. C. BRITTON.

ELEMENTARY HISTOLOGY

Elementary Pathological Histology. By W. G. Barnard, F.R.C.P. 3rd edition. (Pp. 77. 185 illustrations, including 8 in colour. 17s. 6d.) London: H. K. Lewis and Co. Ltd. 1953.

This is the third edition of Professor Barnard's book, which was designed to help students during their first course in elementary pathological histology by providing them with a strictly limited number of large photomicrographs of good quality illustrating the processes of inflammation, degeneration, and tumour formation. This subject is taught just before or early in the student's clinical training, when he needs assistance in forming a clear and permanent visual memory of a few basic pathological lesions, which he should

then be encouraged to look for as he becomes more experienced. By this means he trains himself to deduce from a complex histological picture the fundamental process responsible for it. During this period it is remarkably easy to produce irreparable confusion in the student's mind by a surfeit of illustrations. Professor Barnard's careful selection and rigid censorship have skilfully avoided this pitfall; each of his 185 illustrations justifies its inclusion, and we can safely recommend this book to students about to embark on a subject which rather too often becomes more difficult for them than it should be.

This edition is enlivened by the inclusion of some illustrations in colour. The textual alterations are few, and the short pithy descriptions are eminently suitable for what is, after all, no more than a good laboratory companion, to be used while sections are being examined under the microscope.

GEOFFREY HADFIELD.

MANUAL OF OBSTETRICS

Eden and Holland's Manual of Obstetrics. By Alan Brews, M.D., M.S., M.R.C.P., F.R.C.S., F.R.C.O.G. 10th edition. (Pp. 812; 57 plates, 12 in colour, and 378 illustrations. 52s. 6d.) London: J. and A. Churchill. 1953.

Should an undergraduate textbook provide for the bright student at the top of the class or the dullard at the bottom? Should it give only the bare essentials of a subject—enough merely to provide the average reader with a reasonable expectation of a pass in the qualifying examination, or should it aim at satisfying as well as whetting the appetite of the most intelligent and diligent of students, stimulating them to further endeavour and opening up for them new fields of thought? A wide outlook on education surely demands the latter approach. It brings material as well as spiritual benefit in that the resulting book caters not only for the surmounting of the immediate hurdle of "finals," but remains a companion and a source of reference for the years to come.

Eden and Holland's *Manual of Obstetrics* has always taken the large view, and in consequence has long been recognized as one of the finest textbooks on obstetrics published in this or in any other country. It is renowned not only for its subject-matter but for its style and prose, and this again can have nothing but a favourable impact on the student with a receptive mind. The confidence of the author in the reader is shown not only by the text but by the suggestions for further reading which appear at the end of each chapter.

This edition, like its immediate predecessor, is written by Mr. Alan Brews and has entailed a good deal of modification. Clear photographs and radiographs now take the place of several of the diagrams of earlier editions. Despite thorough revision the author has succeeded in retaining the original style and flavour, and this is no mean achievement.

The undergraduate looking for a sound, attractive, and complete textbook rather than a cram précis could not find a better, and after he has qualified it will be a standby in his practice and in his pursuit of higher diplomas in obstetrics.

T. N. A. JEFFCOATE.

DIABETIC NEUROPATHIES

The Diabetic Neuropathies. By Joseph I. Goodman, M.D., S. Baumoel, M.D., L. Frankel, M.D., L. J. Marcus, M.D., and S. Wassermann, M.D. (Pp. 138. £1 15s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This is a very good book, and, although there are bits and pieces on the subject in many large books on diabetes, it is the only book I know whose authors have put the whole subject together in a competent way. The reading behind the book has been wide and the bibliography ranges through a hundred years since the relations between diabetes and its neuropathic complications were first mentioned.

The authors emphasize the early peripheral nature of this type of complication and give a clear account of how it can creep upwards, if untreated, to the more central nervous system, with protean manifestations—such as impotence, apart from malnutrition; the tabetic-like bladder; chronic relapsing diarrhoea; neuritis of the nerves in the eye, with resulting diplopia, and even retrobulbar neuritis. Mention of the rare involvement of almost any one or two peripheral nerves round the chest and the abdomen or even the phrenic seems to be omitted.

The early attack—perhaps the first manifestation of this neuropathy—on the autonomic nervous system has been pointed out. It would appear that the non-medullated nerve fibres suffer first, and their unprotected axis cylinders are the earliest to suffer degeneration. This has been shown by biopsy material by Martin since this book was written. It is tragic to realize, in the rapid progression of medical discovery, that not even this nor any book is quite up to date. However, it is really excellent and should be read by all neurologists and, shall I say, diabetologists.

R. D. LAWRENCE.

CLINICAL CARDIOLOGY

Clinical Cardiology. Edited by Franklin C. Massey, A.B., M.D. (Pp. 1,100; 250 illustrations. £5 2s. 6d.) London: Baillière, Tindall and Cox. 1953.

The reader of this book cannot help wondering whether the subject of cardiology has really become so large and diffuse that it requires the minds of 33 collaborators to produce a book upon it. It is almost inevitable that there will be repetition and overlapping. This will then lead to a disintegration of the subject, and consequently its complication instead of simplification. It is indeed a pity that the razor of William of Occam had not been used here, and the multiplication of authors and opinions beyond necessity avoided. There has, however, been a sound attempt at a fairly uniform use of technical terms, so "atrial" fibrillation and flutter it is throughout. Each chapter starts with a sort of "Who's Who," so that age, birthplace, and various particulars about its author are set out. The description of the anatomy of the heart in the first chapter is well done; in the chapter on physiology "circus movement" is accepted without comment, but not so in the chapter on arrhythmias. Here, unfortunately, the discussion of diagnosis and treatment and much other information on this subject lack orderly presentation, and the reader is left in some confusion, though the line illustrations are clear and economical. The chapter on physical diagnosis is unsatisfactory. The description of signs is weak and in places hardly accurate.

There is a chapter on the radiology of the heart. This subject should surely be joined with the various matters it helps to elucidate. The sketches are poor, artistically and practically. The surgery of the heart similarly stands alone as a chapter, instead of being discussed where this method of treatment is appropriate. The key to the study of congenital lesions is so short that it is doubtful if it opens any door of knowledge. In the description of angina pectoris on page 622 there is a piece of Latin which would have made Heberden shudder. But this is really a good chapter; unfortunately it lacks the all-important cardiograms, and for them one must turn to the chapter on electrocardiography. The chapter on arteriosclerosis needs a clear basis of pathological classification, but there is much interesting material on atheroma and some good photomicrographs. Most of the chapters give a fairly full list of references from the American literature. The paper and print are excellent, and most of the illustrations are good. The index is full. There is a vast amount of information in this book, but it suffers from having too many authors, and consequently is rather dull to read, for it lacks the individual touch and any sort of soul or personality.

TERENCE EAST.

BRITISH MEDICAL JOURNAL
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THE PRESS AND THE PROFESSION

Professor Ian Aird's letter to this week's *Journal* (p. 153) draws attention to a matter of much concern both to the medical profession and to journalists—the publication in the lay press of intimate details of medical or surgical treatment which traditionally should be the concern of two parties only—the patient and his relatives and those who look after the patient. This traditional reticence, which is primarily in the interests of the patient, has never been strictly observed. For example, the illness of a public figure is rightly held to be a matter of public concern, and his medical attendants will often issue bulletins giving details of the illness and of the treatment administered. In the case of a crowned head this has indeed come to be looked on as a public duty. The editor of a newspaper may, too, consider that his obligations to his readers extend beyond this and through his special correspondents pursue inquiries of his own. *The Times*, for instance, some sixty years ago entered pertinaciously into the controversy over the illness of the Crown Prince Frederick.[1] The other kind of occasion of relaxed reticence is when some spectacular or unusual operation is performed: here it is the procedure rather than the person that is the focus of attention, and, inevitably, the surgeon who carries it out. Professor Aird's letter shows how the natural desire of a journalist to acquire news for his paper—in fact it is his duty as a journalist to do so—may embarrass the surgeon, needlessly alarm the patient's relatives, and have a harmful effect on other patients awaiting a serious operation.

An operation on Siamese twins is news. Modern medicine in the present exciting phase of its development is news. The public wants to know about these things, and any editor or journalist will therefore do what he can to give the public what it wants. How this news is gathered and presented depends upon a number of factors: the standard a paper sets itself; the competence and integrity of the paper's medical or science correspondent; the degree of intelligence and knowledge of science a newspaper's readers may be judged to have; and the extent to which the medical profession may feel it can go in supplying the press with information. It is this last that concerns us most.

There is need for a clearer understanding by the medical profession and the press of each other's problems. Doctors have an intense dislike of publicity, quite unrelated to the fact that publicity may draw upon them the unwelcome attentions of the General Medical Council. In these days the surgeon who operates on a patient is a member of a team, and the operation he performs is more often than not the outcome of the work of others besides himself. His scientific conscience and sense of justice are therefore affronted when he sees himself singled out in the press as the hero of the occasion, and he may fear, not unnaturally, that his colleagues may suspect him of seeking such publicity, and that this will harm what is to him of supreme importance—his professional reputation—and lower him in the esteem of his colleagues; and nothing will horrify him more than to see his photograph staring at him from the front page of the *Daily X* when he opens it at his breakfast table. The journalist, however, knows that his public is interested above all in personalities, and that the only anonymity they will tolerate in a newspaper is the anonymity of the editor and, perhaps, his special correspondents. A matter of life or death, as an operation so often is, is something of intense human interest; when the operation itself is a dramatic one the interest is intensified and the public has a natural desire to know something about the person of the operator, and will tend to brush aside the conventions of the medical profession as of little account. When archbishops, bishops, deans, judges, barristers, field-marshals, authors, and artists submit to the publicity of the press with little demur, why, says the public, should doctors kick against the pricks? The short answer is that no other professional man has such an intimate relationship with his fellow human beings, or has to bring to bear upon them skills that may shift the balance between life and death, apart from the rarely operated skills of barrister and judge in cases of alleged murder.

In his letter Professor Aird suggests that the profession should face the fact that the press will not be content to wait for the presentation of medical facts in the medical journals before it breaks any particular news to its public, and that, this being so, such news might be given to the press through an intermediary such as a public relations officer. He hopes that in this way anonymity might be preserved and accuracy ensured. Helpful though the work of public relations officers is in meeting press inquiries, it may be doubted whether this is a solution to the problem. The press seems to be relying more than it used to do on scientific and medical

[1] See *Morell Mackenzie*, by R. Scott Stevenson, London, 1946.

periodicals as a basis for the scientific and medical information the papers dish up for their readers; and, if we may judge from our own experience, reporters seek and welcome a closer co-operation with the editorial staffs of such periodicals in trying to ensure the accuracy of the accounts they write for their papers. Such co-operation might well be extended, and, busy though practising doctors are, they should, we suggest, do what they can to help the practising journalist when he makes a bona-fide request for information. A good journalist will always respect his informant's desire for anonymity and keep his word that any background information should be regarded as confidential. A better relationship between doctors and the press should go a long way to prevent a repetition of the harassing experiences which have provoked Professor Aird's letter, intensified as they were by the shocking behaviour of certain press photographers against whose thug-like intrusions the hospital authorities had to act by blacking out the lower halves of the windows of the wards where the Siamese twins were lodged. If any surgeon is faced with Professor Aird's dilemma in the future he would be well advised at the outset to seek the help of the public relations officer of the B.M.A. and thus make use of the facilities available in his own professional organization.

An operation on Siamese twins is as rare as the twins themselves, and such an intensive news-hunt is unlikely to be common. But our journalist colleagues of the lay press will surely remember on any such future occasion that the strain on those carrying out difficult medical or surgical procedures is heavy, and that any intrusion on them in the course of their work or in their homes can do nothing but harm. Possibly the many responsible science writers attached to newspapers would consider among themselves how best to deal with this matter of gathering and presenting medical news to their readers, if only for the reason that what they say and how they say it has a profound effect upon men and women who may at any time be in need of medical care. The medical profession has no wish to regard its art and science as an esoteric mystery, and recognizes that with a public more widely educated in science this cannot be the case. It fears, however, the ill effects of premature publicity and the dangers of the unwittingly distorting head-line. Professor Aird's letter will have served a useful purpose if it makes profession and press more conscious of each other's difficulties and makes mutual and responsible co-operation easier in the future. The doctor's first and last concern in all this is to protect the interests of his patients and their relatives.

GENERAL PRACTICE ANALYSED

In the opening pages of this issue we publish a paper by Drs. E. M. Backett, J. C. G. Evans, and Mr. J. A. Heady which reports selected results from a year's statistical study of what they call "some of the more quantitative aspects of the doctor's job." The authors of this study, which is an experimental part of a larger study of the methods which might be used to investigate general practice, examined one closely knit working-class urban practice of some 3,000 patients in charge of one principal assisted by a trainee and, occasionally, by another practitioner. Private practice is not mentioned, and presumably was non-existent. The principal and his assistants bore the main burden of record keeping—a simple basic form completed after every consultation—and every six weeks members of the research team attended all consultations for one week and recorded in greater detail what went on. A consultation, the basic unit of work studied, was taken to mean any meeting between doctor and patient in which advice was given, and included telephone inquiries, visits to patients in hospital, "and the like." It is estimated that 99% of consultations were recorded.

Fry[1] and Logan[2] directed their studies to ascertaining the amount and kind of ill-health in particular practice communities, and Fry also reported figures illustrating the amount of work done by the doctor. In the present study the authors report only on the amount of work done and relate it to the nature of the practice population grouped by sex and age and by type of illness classified as serious or not serious, acute infective or acute non-infective, or chronic. The patients' occupations were not taken into account.

The following are some of the facts which emerge. During the year 15,788 consultations took place, which represent 72% of the practice population, or five for every registered person or seven for every person who consulted. On examination it is found that of those aged over 64 (10% of the practice) 25% of males and 32% of females consulted the doctor on 10 or more occasions. Thirty-six per cent. of the total consultations were in the patient's home, and, of this 36%, 50% were for children and the elderly. Only 12% of children aged 0–4 did not see the doctor at least once. In all age groups the percentage of males who had no contact with the doctor is greater than that of females. Half of all the work was on one-sixth of the patients (some 500), who saw the doctor 10 or more times, and 18% of the work concerned 4% (125), who consulted 20 times or more.

1 *British Medical Journal*, 1952, **2**, 249.
2 *General Practitioners' Records*. General Register Office: Studies on Medical and Population Subjects, No. 7, 1953, H.M.S.O., London.

Twenty per cent. of diagnoses were of chronic disease and entailed 30% of the work. Acute infective disease accounted for 50% of diagnoses and 50% of the work, and the 10% of serious diagnoses accounted for 43% of the work. One certificate was given for every 4.5 consultations, and half of these were for National Health Insurance purposes. Reference to hospital or other agency occurred at the rate of 35 for every 100 registered persons. During 10,889 out of 15,788 consultations, one or more prescriptions were issued, and this equals at least five for every patient who consulted.

It is worth emphasizing that these facts relate to one community of people and one doctor and his assistant. They cannot be taken to be representative of general practice as a whole or even of practices of a similar kind, nor do the authors claim that they should. With this proviso in mind it may be remarked that the facts coincide in many respects with those of other observers and will confirm what has been up to now generally accepted on the evidence of experience. For instance, that old people and chronic illness should loom large in a G.P.'s work is to be expected, but perhaps the proportion of work with young children and females of all ages has not been so well realized. It is interesting that of the hard core of sick people in the practice over half were under 45 years of age and more than a quarter were children and therefore a fruitful subject for the practice of rewarding medicine. Likewise the fact that 43% of the general practitioner's work is associated with illness diagnosed as serious supports the same encouraging contention, and, as the authors say, tends to refute statements such as "the general practitioner is a specialist in the trivial."

Our correspondence columns have often borne witness to conflicting opinions on what are the aims of general practice and what are the principal needs that patients look to their family doctors to satisfy. The inquiries being carried out under the Medical Research Council and elsewhere will help to answer these questions, made the more urgent by the rapidity of technical advance in this mid-twentieth century, when the ascertainment, prevention, and treatment of disease in general practice are fast changing.

MYELOMATOSIS

Multiple myeloma is a condition which is all too often diagnosed incorrectly. A case with conspicuous bone lesions may be regarded as an example of secondary carcinoma from a latent and undiscoverable primary tumour, while sometimes the presence of bone lesions is not suspected during the life of the patient. For reasons of this sort it is not easy to be sure of the frequency of occurrence of what is regarded by some as a very rare condition. The paper by Mr. A. Naylor and Dr. F. E. Chester-Williams which appears at page 120 of this issue of the *Journal* is therefore of interest in that it describes a series of twenty-five cases, twenty-four of which occurred in one hospital group during a period of five years.

Not only is their paper a reminder of the frequency of this condition, but the series of cases they describe emphasizes the diversity of clinical presentation associated with it. Seventeen of the twenty-five cases showed the conventional "generalized" picture with multiple bone involvement by discrete osteolytic lesions. Naylor and Chester-Williams regard this as the terminal stage of myelomatosis, and in an endeavour to institute early therapy, and to avoid confusion with other conditions, they draw attention to two other types of case which are perhaps not so generally known. In their series the first of these is a group of four cases in which a solitary lesion was initially found, and the second—also of four cases—was characterized by diffuse bone involvement without focal radiological lesions.

As to the way in which patients with multiple myeloma present clinically, it is of interest to note that in this series six of the patients with the generalized form of the disease sought medical attention because of general symptoms—particularly those related to the anaemia produced by replacement of bone marrow by myeloma tissue—and showed no clinical evidence of skeletal involvement.

Occasional examples of solitary myeloma (sometimes called solitary plasmocytoma of bone) have been reported, and have been reviewed recently by Raven and Willis[1] and by Lumb.[2] This type of case is rare, and in Naylor and Chester-Williams's series generalization soon occurred in each of the cases in which an initial solitary lesion had been found.

Of recent years interest has been aroused by chemical studies on the abnormal proteins present in the urine of many patients with multiple myeloma (originally noted by Bence-Jones in 1848,[3] and known by his name), and in the related abnormal plasma protein constituents which are also present: studies of these proteins have been reviewed by Rundles *et al.*[4] It has been shown by Martin[5] and by Miller *et al.*[6] by means of electrophoresis and ultracentrifugation that the myeloma tissue itself contains the same abnormal globulin as is present in the blood, which finding suggests that the plasma-celled tumour tissue is concerned in the synthesis of these protein molecules. This is of considerable importance in view of the increasing emphasis given by such workers as Fagraeus[7] and Bjorneboe *et al.*[8] to the role of plasma cells in the production of the rather similar globulin molecules of antibodies.

[1] Raven, R. W., and Willis, R. A., *J. Bone Jt Surg.*, 1949, **31B**, 369.
[2] Lumb, G., *Ann. roy. Coll. Surg. Engl.*, 1952, **10**, 241.
[3] Bence-Jones, H., *Philos. Trans. B*, 1848, **138**, 55.
[4] Rundles, R. W., *et al.*, *J. clin. Invest.*, 1951, **30**, 1125.
[5] Martin, N. H., ibid., 1947, **26**, 1189.
[6] Miller, G. L., *et al.*, *Cancer Res.*, 1952, **12**, 716.
[7] Fagraeus, A., *Antibody Production in Relation to the Development of Plasma Cells*. Stockholm. 1948.
[8] Bjorneboe, M., *et al.*, *J. Immunol.*, 1947, **55**, 121.

A NEW ORAL DIURETIC

Efficient diuretic treatment is almost as important as digitalis therapy in the management of congestive heart failure, and is of major importance in the treatment of many other oedematous states. No other diuretics compare in efficacy with the organic mercurials, and in view of their many clinical applications it is rather surprising that they are not used more often in general practice.[1] Doubtless the necessity of administering mersalyl parenterally militates against its more common use. For maintenance treatment many patients require two or three intramuscular injections a week, and, as these may have to be continued over some years, the treatment is apt to be abandoned in the course of time. These inconveniences would be obviated by the discovery of orally administered diuretics which are really effective. Recent clinical trials in America[2-4] have been carried out with 3-chloro-mercuri-2-methoxy propylurea. Named in the U.S.A. "neohydrin," and now made available in Britain with the name "mercloran," it is an extremely effective diuretic whose potency when given orally is about one-fourth of its potency when given by intramuscular injection. No other mercurial diuretic approaches such a favourable ratio of oral to intramuscular potency. Experience suggests that a daily individual dose is more effective than the same amount given in divided doses throughout the day. As with mersalyl, the dose should be given immediately after breakfast, and its effect is potentiated by the previous administration of ammonium chloride and a low sodium intake.

Besides the two problems presented by an injected diuretic—systemic toxicity and diuretic potency—an orally administered agent presents a third problem of local gastro-intestinal irritation, and unfortunately this is very commonly produced. Clearly if the oral dose is small enough the incidence of such side-effects vanishes, but so does the diuretic action, and it appears impossible to obtain with mercloran the diuretic effect commonly produced by, say, 2 ml. of intramuscular mersalyl, without inducing a prohibitive number of unpleasant gastro-intestinal symptoms. Few patients indeed seem to be able to tolerate a dose which will give a diuretic response of more than would be expected from about 0.5 ml. of intramuscular mersalyl. Nevertheless, even if abdominal cramps, nausea, vomiting, diarrhoea, and bloody stools develop in about two-thirds of patients after effective doses of mercloran, there is the remaining one-third of patients who will tolerate it well. These can be discovered only by trial and error, but for them the inconvenience of long courses of injections can often be eliminated; in others, more sensitive to the drug, it may be possible by the use of appropriate smaller doses to prolong the interval between injections. While, therefore, the use of this preparation may be limited, it is likely to prove a useful addition to the list of new drugs.

1 Dunlop, D. M., *et al.*, *British Medical Journal*, 1952, **1**, 292.
2 Greiner, T., *et al.*, *Proc. Soc. exp. Biol. (N.Y.)*, 1952, **80**, 117.
3 Bresnick, E., and Abramson, J., *New Engl. J. Med.*, 1953, **249**, 681.
4 Greiner, T., and Gold, H. *J. Amer. med. Ass.*, 1953, **152**, 1130.

INHALED FOREIGN BODIES

When a foreign body is aspirated into and retained in a bronchus many pathological changes may arise. Most foreign bodies irritate the bronchial mucosa, causing chronic inflammation which gives rise to a persistent cough. If the bronchus is completely occluded by the foreign body, the corresponding pulmonary segment collapses; distal infection in the collapsed segment often proceeds to bronchiectasis or lung abscess. Even when bronchial obstruction is not complete, the lung segment is liable to recurrent pneumonia, which may be complicated by pleurisy or empyema. Finally, it is possible for a foreign body to cause valvular obstruction to the bronchial lumen, so that air cannot escape during expiration and obstructive emphysema is produced. Thus the clinical features resulting from the accidental inhalation of material into the bronchus are extremely variable, and in the absence of a clear history of such an accident the underlying cause of the trouble is easily overlooked.

The hazards of inhaling foreign bodies are greater in young children, in whom the choking and gagging due to "something going the wrong way" are of commonplace occurrence. On page 125 of this issue of the *Journal* Dr. Bernard Laurance describes the cases of three children who developed serious pulmonary disease after inhaling foreign bodies. In one child, who had recurrent lung abscesses, pleural effusion, recurrent pulmonary collapse, and repeated haemoptyses, the true cause of the disease was discovered only after lobectomy showed an ear of barley within an abscess cavity in the removed lobe. Several thorough bronchoscopic examinations had failed to disclose the offending ear, although its presence had been suspected. In the other two children re-expansion of a collapsed lobe followed the successful removal of vegetable bodies by bronchoscopy, but in one case there was residual bronchiectasis. Dr. Laurance emphasizes that both lung abscess and haemoptysis are rare manifestations of bronchial foreign bodies in children. His cases also serve as a useful reminder that there is often a long latent interval between the inhalation of foreign bodies and the onset of respiratory symptoms. Indeed, it is not unknown for large bony fragments to be removed from the bronchus of patients who vehemently deny any possibility of their having been inhaled.

The diagnosis of foreign bodies in the bronchus is not always easy, but the possibility should be constantly remembered. When a history of inhalation of foreign material or choking over food is given by a parent or patient, full examination should never be neglected. Radiographs in the postero-anterior and lateral positions may assist diagnosis by showing segmental collapse, consolidation, or emphysema, but if any doubt remains bronchoscopy should be done. Even in the absence of a history of inhaling a foreign body, bronchoscopy should be done in patients with lung abscess, persistent pulmonary collapse, or prolonged or recurrent pneumonia. Such patients are often found to have underlying bronchial obstruction, and if a foreign body is found to be the cause its

removal at bronchoscopy is usually all that is required to bring about full clinical recovery.

CURRENT RESEARCH ON INFLUENZA

By the end of the last war laboratory methods for the study of influenza had been so simplified that it seemed opportune to study the disease on an international scale. The primary task of co-ordination and of promoting the exchange of scientific information was undertaken by the World Health Organization, whose latest monograph[1] gives an account of research on influenza. A principal task has been the detailed examination of virus strains from all over the world. Two main serological types of virus, A and B, have been recognized since 1940 (a third type C has been described, but its relation to epidemic disease is not yet clear). Virus A has consistently been found in association with major epidemics. A closer examination of A strains shows a definite change in antigenic character, whereas B strains are more homogeneous and less concerned with epidemic disease.[2] The original strain of 1933 (WS) was largely replaced about 1935 by a new type, PR8, which in turn gave way in 1947 to the current A-prime strains. There is every indication that this is a progressive change, though some doubt exists about its cause. As to further changes, time will show.

It seems clear from the behaviour of influenza in recent years that influenza-A epidemics may not only spread from country to country but may have multiple points of origin. Andrewes[3] considers this to be in favour of the concept of a "hidden" or "basic" virus in the inter-epidemic period which reappears when conditions are favourable. A virus which is capable of such antigenic change will clearly be at an advantage in securing a foothold if it differs from its predecessor. In addition the influenza-A viruses appear to have developed a more flexible method of coping with the immediate problem of survival in a partially immune population. Strains have been recovered which show a marked variation in susceptibility to antibody. Isaacs considers that this biphasic change (P–Q variation) may be a more common form of variation than the appearance of a new strain.[2]

In the laboratory it has been found possible to create new virus types. Australian workers[4] have shown that following infection of the chick embryo with two distinct influenza strains the resulting viruses may under appropriate conditions show a switch-over of inherent properties. Fascinating as this subject of virus recombination is, its precise relation to human disease is by no means clear. The emergence of new strains in 1947 is also reflected, not unnaturally, in antibody changes in the population[5] and in the constitution of virus vaccines.[6] Francis[6] has shown that by incorporating A-prime strains into vaccines significant protection can be obtained even when the current strain is not identical with that incorporated in the vaccine. Recent experimental work on combining adjuvants with virus vaccines has given encouraging results. Preliminary tests in man point to a much higher antibody titre with adjuvant vaccine than with aqueous vaccine.

Influenza can be a lethal disease with considerable variation in severity from one epidemic to another. In the 1918 pandemic an undue proportion of young adults were killed. In the Liverpool epidemic of 1951 most of the deaths occurred in old people. Mulder and Stuart-Harris discuss[7] the differential diagnosis and treatment of pulmonary complications such as influenzal bronchiolitis and pneumonia. Energetic treatment with antibiotics is particularly necessary in the latter case when infection with *Staph. pyogenes* is superimposed on an epithelium denuded by virus action. This monograph should do much to help international research into a disease capable of causing world-wide havoc.

1 *Influenza.* W.H.O. Monograph Series No. 20. 1954.
2 Isaacs, A., *Brit. med. Bull.*, 1953, **9**, 208.
3 *Influenza.* W.H.O. Monograph Series No. 20. 1954. P. 9.
4 Burnet, Sir Macfarlane, ibid., p. 67.
5 Hilleman, M. R., *et al.*, ibid., p. 25.
6 Francis, T., ibid., p. 125.
7 Ibid., p. 141.

IONIZING RADIATIONS

The ionizing radiations used in industry include *x* rays, and the alpha, beta, and gamma radiations emitted by radium, mesothorium, and many radioactive isotopes now available from atomic energy establishments. The description of the manifold industrial applications of these sources of radiation, contained in a pamphlet[1] issued by the Factory Department of the Ministry of Labour and National Service, shows clearly how the speed, efficiency, and improvement of modern chemical and engineering processes are dependent on the facilities which radiography provides for examination and control of their products. The examination of castings, forgings, and metal articles subjected to high stress, for which *x* rays were until recently chiefly used, is now widely carried out by means of radioactive isotopes such as cobalt^{60}, tantalum^{182}, and iridium^{192}, since they have the advantages of mobility, relative cheapness, and automatic control. Among the many other uses of ionizing radiations are the elimination of static electricity in processes where accumulation of an electric charge may be either dangerous or highly inconvenient, measurement and control of the thickness of materials, sorting of packets passing along conveyor bands, and calibration of monitoring instruments. The chief application of radium itself or of mesothorium is its incorporation into a self-luminous compound for painting instrument and clock dials in the process known as "luminizing."

This is the only use of radioactive material in which precautions against health hazard are specially required by law (the Factories (Luminizing) Special Regulations, 1947). Other ionizing radiations are the subject of recommendations and safety codes which have been published from time to time in an attempt to minimize, on a voluntary basis, the risks to health arising from their use. Such are the recommendations drawn up by the British *X*-ray and Radium Protection Committee (Seventh Revised Report, 1948), and by the Sixth International Commission on Radiological Protection in 1950. The latter body agreed on the maximum permissible dosage rates, which are regarded as a proper basis for

1 *Precautions in the Use of Ionizing Radiations in Industry.* Ministry of Labour and National Service. H.M.S.O. 2s.

protective measures and on no account to be exceeded. General precautions are directed towards minimizing the exposure of workers to powerful sources of radiation by suitable planning of equipment, so that protection may be given by distance, screening, and remote control. Other measures include the prevention of inhalation or ingestion of radioactive gases and dusts by suitable ventilation; adequate supervision by trained persons; recording of exposure by means of dosimeters or photographic films; and periodical medical examination with regular blood counts when possible and desirable. When all such precautions are carefully observed the danger of ionizing radiations has been found to be slight, but the potential hazard of overexposure through accident or carelessness must always exist. Awareness of it is particularly important at a time when the rapidly expanding use of radioactive substances entails exposure to them of an increasingly large section of the industrial population.

HYALINE MEMBRANE IN THE NEWBORN

Pulmonary hyaline membrane in the newborn is an amorphous, acidophil deposit on the walls of air spaces, chiefly respiratory bronchioles and alveolar ducts. It forms only in spaces that have received air, though similar hyaline material may occur in lumps in unaerated alveoli. The affected air spaces become overexpanded, while the rest of the lung substance is in complete atelectasis. Rupture of overexpanded air spaces may produce interstitial emphysema and pneumothorax.

Hyaline membrane is a common condition. Potter[1] considers that it is responsible for more deaths of live-born infants in the neonatal period than any other single cause. It is seen chiefly in the premature, and is usually the only apparent cause of death. It occurs much less commonly in full-term infants, and is rare in premature babies weighing under 1,000 g. (2¼ lb.). It is not found in the stillborn, and has not been observed under one hour after birth. Several observers have noted a high incidence in babies delivered by caesarean section.

In the typical clinical picture the baby breathes spontaneously and may appear well until several hours after birth, when respiratory difficulty develops, with inspiratory recession of the sternum and lower ribs, and cyanosis. Deterioration is progressive until death, which is usually within 30 hours of birth, though some live till the fourth day or longer. While this picture should suggest hyaline membrane, it can be due to other causes, and the diagnosis can be confirmed only by microscopical examination of the lungs. It is not known how often affected infants survive. Clinical observation suggests that some recover, and the recent radiological study of Donald and Steiner[2] supports this view.

The cause of death is atelectasis, which is constant and always severe. It is usually regarded as resorption atelectasis, developing after membrane has formed and sealed off the more distal air spaces. This opinion is supported by the study of Donald and Steiner, who demonstrated radiological changes in the lungs indicating progression of atelectasis from alveolar to lobular or lobar extent. Histological studies, however, suggest that the atelectasis may be in part primary.

The chemical composition and the cause of the membrane are not fully understood. Because it often contains stainable lipoid, it was for long believed to be composed of vernix caseosa, inhaled together with liquor amnii; but lipoid is not constantly present. Claireaux[3] recently claimed to have produced it experimentally by injection of macerated epithelial squames from liquor amnii. Blystad *et al.*[4] suggested that it is formed from protein of the amniotic fluid concentrated after a period of air breathing. Other workers believe that the membrane is an exudate or transudate. Hyaline membrane is not peculiar to the newborn; similar membranes have been described in older subjects in various diseases, including influenzal and rheumatic pneumonia, irritant gas poisoning, and heart failure. In the newborn, some authorities have suspected oxygen as the cause, but the condition occurs in the absence of oxygen therapy. Although most affected babies who survive for 48 hours develop pneumonia, there is no evidence that the membrane is of infective origin. Failure of adaptation of the pulmonary circulation to postnatal conditions, possibly associated with persistent primary atelectasis, might be responsible.

While the cause of the condition remains uncertain, treatment and prophylaxis can only be empirical. Some workers claim success for measures directed to thorough clearing of the air passages, while others recommend oxygen and high atmospheric humidity. A comprehensive review by Tran-Dinh-De and Anderson[5] is commended to the interested reader.

1 Potter, E. L., *Pathology of the Fetus and the Newborn*, p. 249. Chicago. 1952.
2 Donald, I., and Steiner, R. E., *Lancet*, 1953, **2**, 846.
3 Claireaux, A. E., ibid., 1953, **2**, 749.
4 Blystad, W., *et al.*, *Pediatrics*, 1951, **8**, 5.
5 Tran-Dinh-De, and Anderson, G. W., *Obstet. gynec. Surv.*, 1953, **8**, 1.

THE ANNUAL MEETING

This year's annual meeting of the B.M.A. is to be held at Glasgow on July 1–9, and the provisional programme is published in the *Supplement* this week so that members may make a note of the dates and as many as possible arrange to attend. The President-Elect is Sir John McNee, who after a distinguished career in London gave lustre for seventeen years to the post of Regius Professor of Practice of Medicine in the University of Glasgow, retiring last October. A great variety of events are being prepared for the instruction and entertainment of the visitors. These include three plenary scientific sessions. The success of the plenary sessions in the last two years has encouraged the organizers to hold them again, and the themes chosen for discussion at Glasgow are "The Problem of Sleep," "Food and Disease," and "The Problem of Pulmonary Tuberculosis To-day." Seventeen scientific sections will meet on July 7–9, and there will be a scientific exhibition on the lines of those which were so successful at Dublin in 1952 and at Cardiff last year. A number of special excursions have been arranged for the ladies. Early reservation of hotel accommodation is advisable, and it is hoped that as many doctors as possible will be able to attend, even if only for a day or so, and share in the warm hospitality that is an invariable feature of the Scottish scene.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

EXAMINATION OF FAECES FOR INFECTION AND INFESTATION

BY

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When a patient has diarrhoea it is usually desirable to know the cause of the attack. The symptoms may be so mild that the doctor is inclined not to have the faeces examined, but an early investigation can provide valuable information, particularly if the disease does not clear up as quickly as expected. Also, even if the patient is only slightly ill, the same pathogenic agent could produce a severe illness in other members of the house.

The bacterial infections are those caused by the dysentery, the food-poisoning, and the *Bact. coli* groups of organisms. Bacillary dysentery is usually associated with diarrhoea, often accompanied by colic, and the organisms causing this disease belong to the genus *Shigella*. In England the commonest of these is the Sonne bacillus. *Salmonella* is the food-poisoning group, and one of the most often encountered in this country is *Salm. typhi-murium*. The patients usually have severe diarrhoea and often vomiting. The enteric group (typhoid and the paratyphoids) also belong to the genus *Salmonella* but are not usually included among the food-poisoning group.

During the past ten years many fulminating food-poisoning epidemics have been caused by organisms which do not belong to the salmonella group, such as the enterotoxin-producing *Staphylococcus aureus* and the heat-resistant strains of *Clostridium welchii*. The symptoms in this type of food-poisoning are caused by toxins produced in the food by these organisms, and for this reason the incubation period is a very short one of only a few hours. In this form of toxic food-poisoning it is nearly always possible to isolate the causal organisms from the faeces.

Diarrhoea can also be caused by protozoal infections. Apart from the importance of diagnosing the cause of an attack of diarrhoea, an examination of the faeces is often necessary to prove whether or not there is a worm infestation or whether there is a metabolic disorder which affects the intestinal tract.

Collection and Delivery of Specimens

Rectal Swabs.—The passage of an ordinary sterile throat swab through the anal canal is a convenient way of obtaining a specimen that will not be contaminated after it leaves the body. Apart from any aesthetic objection to this method, these specimens are very often anal and not rectal swabs. Once the swab has passed the external sphincter the cotton-wool can be caught by the loose anal mucosa, which makes it feel as if any further pressure would tear the mucosa. Anal swabs, as distinct from rectal swabs, can provide misleading false cultural results.

Sheathed Rectal Swabs.—Some laboratories surround the swab with a suitably sized glass sleeve with rounded ends. These swabs are sterilized with a small quantity of liquid paraffin at the bottom of the containing test-tube and the lower end of the glass sleeve is lubricated. This lubricated glass tube is inserted through the anus with a to-and-fro rotary movement until the internal sphincter is felt as a distinct obstruction. The tube is pushed gently through the internal sphincter and the swab is then passed up into the rectum, after which it is withdrawn within the glass sleeve. Both are then removed and reinserted into the test-tube. In babies with acute diarrhoea this method is very convenient, as on touching the internal sphincter the whole of the glass sheath is filled with liquid faeces, which otherwise would have soaked into a nappy.

Faeces.—Care must be taken to avoid contamination of the specimen after it leaves the body. All laboratories provide sterile containers which incorporate a spatula with which faeces can be picked up. In hospitals it is relatively easy to obtain uncontaminated faeces, and there are several ways of doing this in the home. One is to pour boiling water into a chamber-pot, which is then emptied; when it is cool the motion is passed into it. Another method, which avoids using a chamber-pot, is for the patient to empty his bladder and then fill the lavatory pan with many layers of toilet paper, on to which the motion is passed. The specimen is obtained with the spatula, after which the toilet is completed. Before using the technique it is convenient to remove the nether garments, as otherwise it is awkward for the patient to turn round to obtain the specimen.

Delivery to the Laboratory.—When cultural examinations are required a delay may reduce the numbers of the viable pathogens, especially if the specimen is on a rather dry rectal swab. When the specimen is being examined to establish a diagnosis, this delay may be dangerous to both the patient and his contacts. Very often some member of the patient's household can deliver the specimen to the laboratory if it is not too far from the home. Some laboratories issue tubes containing glycerol-saline into which a specimen of faeces is placed. This helps to prevent pathogenic organisms dying in transit, and it may be convenient for the practitioner to keep a supply of these bottles in his surgery. A specimen with only an occasional pathogen present will give entirely negative results if tested when 18 hours old—that is, if posted to the laboratory. Examinations for *Entamoeba histolytica* must be made on very fresh specimens, as only the cysts will be seen in faeces which have been allowed to cool.

Information Provided

Most laboratory examinations of the faeces are carried out to exclude or confirm the presence of pathogenic organisms or parasites. Therefore normal appearances and results are not usually reported, merely whether or not abnormalities are detected.

Routine examinations should enable infections caused by salmonellae, shigellae, the specific serological types of *Bact. coli*, *E. histolytica*, and *Giardia lamblia* to be diagnosed. The presence of an infestation with ascarides (roundworms) or with rarer worms such as whipworms is usually relatively easy to determine.

Direct Wet Smears.—Many laboratories make a direct examination of the faeces, without which the presence of amoebae, amoebic cysts, and *G. lamblia* would be entirely missed. In the acute stages of a dysentery and of many salmonella infections the finding of pus and red cells in excess of mucus may indicate the need to institute barrier nursing within a very short time of the specimen having been received in the laboratory. In infants the presence of many fat globules may be the earliest indication of fibrocystic disease of the pancreas; these babies are sometimes first seen as cases of diarrhoea. In ulcerative colitis there is usually a great deal of blood and mucus as well as pus in

the faeces, but the proportion and amount of each of these are very variable. Except that there is usually more blood present, this exudate may be very like that of a dysentery and may be misleading at first.

How Soon?

Immediately

The direct examination, outlined above, allows an immediate diagnosis of amoebiasis and *G. lamblia* infestation, but it must be remembered that the latter is not uncommonly associated with Sonne dysentery, both infections having been acquired at the same time. Worm infestations will be diagnosed immediately but they are more conveniently dealt with separately.

The laboratory may also be able to suggest that dysentery is present by demonstrating an exudate in the direct smears: this could allow early segregation of the case, which might help to prevent the infection spreading.

After 18–24 Hours

The specific serological types of *Bact. coli* which cause epidemic enteritis in infants are primarily identified by slide agglutinations of 18-hour-old cultures. These results have to be confirmed by further laboratory tests, which take a day or more to complete. False-positive reactions are relatively common when a laboratory first undertakes these examinations, so the confirmatory tests are extremely important. With experience the number of false-positive results becomes much smaller, as the technician soon learns which type of reaction is a false-positive result if he is constantly checking the slide-agglutination results by tube agglutinations. Therefore laboratories which are constantly making examinations for these *Bact. coli* types can fairly safely diagnose their presence within 18 hours of the receipt of the specimen.

The Sonne bacillus gives very characteristic colonies on desoxycholate citrate plates, and slide agglutination of 18-hour-old cultures provides an answer which further laboratory tests usually confirm as correct.

The colonies of salmonellae on selective media can be examined by slide agglutination, and experienced workers will often be able to make a tentative diagnosis of a salmonella infection after one day's incubation. As the danger of a false-positive result is much greater in this type of infection than it is with Sonne dysentery, some pathologists prefer to wait another day, when confirmatory tests would be available.

After Two Days

Confirmatory biochemical and tube agglutination tests on organisms isolated on the first day will be nearly completed after 24 hours. The more specialized selective media, such as Wilson and Blair's bismuth sulphite plates for the enteric group, will be producing their first identifiable colonies. The enrichment media, such as selenite, tetrathionate, and brilliant green, will be subcultured after 24 hours, and the subcultures will be giving recognizable colonies after 48 hours.

It will thus be seen that after 18 hours a tentative diagnosis of infections due to *Sh. sonnei*, specific types of *Bact. coli*, and a few species of *Salmonella* can be made, but the confirmatory tests will take a few days longer. However, it is not unusual to isolate the pathogens by means of the enrichment techniques only, which means that the first positive results might not become available for three to four days.

Reference Laboratories.—Because of the great complexity of the antigenic structure of the members of the shigella and salmonella groups, in which there are over 250 types, reference laboratories have been established by the Medical Research Council. Laboratories are encouraged to send all salmonella and shigella cultures, except those of *Sh. sonnei*, to these reference laboratories so that the identity of the organisms can be confirmed. Therefore a provisional report naming a salmonella may be followed by a second giving an entirely different name. However, the treatment of the condition will be the same: correct identity of the organism is of importance only to the public health authorities in their efforts to trace the origin of the cases and the connexion between them.

Infestation with Worms

If the whole worm or segments can be sent to the laboratory so that its identity could be confirmed any clean convenient container is suitable.

Threadworms (Oxyuris vermicularis) (Fig. 1) can occasionally be seen adhering to the surface of faecal scybala, otherwise they are rarely found in faeces. If there is any doubt about the identity of threadworms, it is advisable to send the specimens to the laboratory, as vegetable fibres can be mistaken for these small worms (about ½ cm. long). The ova of threadworms (Fig. 2) are never found in the faeces, as they are deposited on the perineum by the female worms. A "sellotape" slide produces a very convenient and easy method of diagnosing threadworm infestations. The slides can be prepared by placing a strip of 1-in. (2.5-cm.) sellotape on a glass slide. In the morning, before the child dresses, the mother detaches from the slide nearly the whole length of the sellotape. The sellotape is stuck on the skin near the anus and is immediately slowly removed. It is then stuck back flat on the glass slide and sent to the laboratory. These slides are much easier to examine than the old N.I.H. "cellophane" swabs.

FIG. 1.*—Two threadworms. (× 12.)

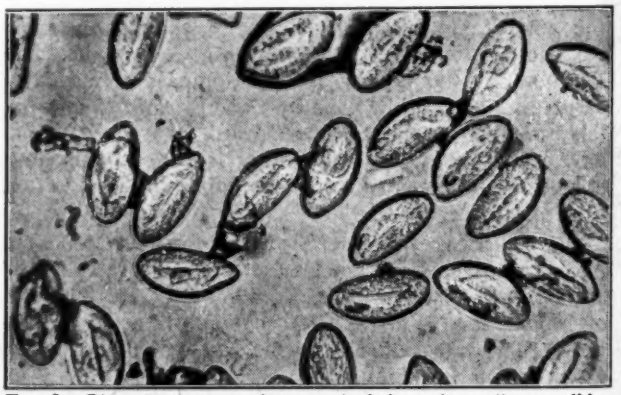

FIG. 2.—Threadworm ova photographed through a sellotape slide. The coiled larvae can be seen within the transparent shells. (×280.)

Roundworms (Ascaris lumbricoides) can be between 3 and 8 in. (7.5 to 20 cm.) in length.

Tapeworms (Taenia saginata and *Taenia solium).* When mature segments (Fig. 3) are passed they measure about ½ by ¼ in. (1.3 by 0.6 cm.), are coloured pinky grey, and may show slow movements. The type of taenia infection can be ascertained easily if one of these segments is blotted very thoroughly so that the adherent mucus is removed, dried, and then pressed firmly between two microscope slides. When held up against a bright light the number and arrangement of the uterine horns are easy to see. The commonest tapeworm in England is *T. saginata*, which has 20–30 uterine horns. If the laboratory is to look for the head of the

*All the photographs in this article were taken by Mr. J. G. Williamson, of the Children's Hospital, Birmingham.

tapeworm (Fig. 4), all the faeces passed after the administration of the saline aperient should be sent for examination. A search is made for the head by washing the faeces through a metal 28-mesh sieve. Unless such a sieve is used the head of the worm may be lost, so no attempt should be made to concentrate the specimen before it is sent to the laboratory. Specimens should be sent to the laboratory as

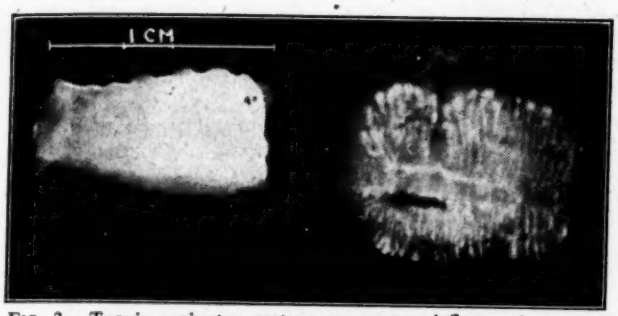

FIG. 3.—*Taenia saginata:* mature segment and flattened segment showing uterus.

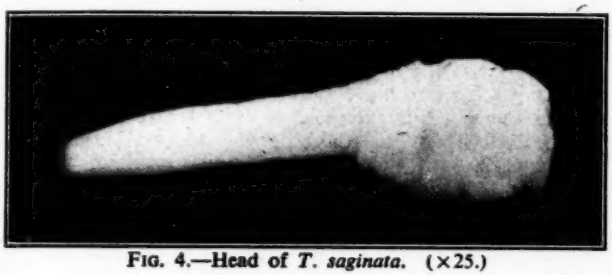

FIG. 4.—Head of *T. saginata.* (×25.)

soon as possible, for once the worm has been passed it tends to degenerate. It is worth remembering that tapeworm ova are very rarely found in the faeces, because they are not liberated until the mature segments degenerate.

Criteria of Cure

If any of the antibiotics, such as chloramphenicol, aureomycin, or terramycin, have been given, or one of the intestinal sulphonamides, tests of cure should not be started until about five days after the drug has been stopped.

Salmonella and Shigella.—At least three consecutive negative examinations are necessary before a cure can be established. Because salmonella organisms often localize in the gall-bladder, it is best to obtain a specimen of faeces after a saline aperient, which will act as a cholagogue.

Specific Serological Types of Bact. coli.—Before it is safe to allow a child who has been excreting these organisms to enter an uninfected community of infants at least six faeces cultures, taken on alternate days, should be negative. If the baby is living in a community in which a specific type of *Bact. coli* is endemic, then it is preferable for the clearance tests to be made when the baby is away from that community. If the infant is going to its home, and other babies are not in the house, three negative results would be sufficient.

G. lamblia.—Three daily specimens should be examined three days after the mepacrine course has finished. It must be remembered that other members of the household may be infected and in this way the patient may easily become reinfected.

Ascaris, etc.—Examination for the ova of worms is preferably made on faeces obtained following a saline aperient, and at least six negative specimens should be obtained.

E. histolytica.—At least six daily specimens obtained after saline aperients should be examined for the cysts. It is also advisable to repeat these examinations six months later.

Next article on Clinical Pathology.—"Chemical Examination of the Faeces," by Dr. W. W. Payne.

"STATUS LYMPHATICUS," THE GROWTH OF A MYTH

BY

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The latest edition (the sixteenth) of *Principles and Practice of Medicine*, originally edited by Osler, defines status lymphaticus as "a combination of constitutional anomalies, among which are hyperplasia of the lymphoid tissues and of the thymus gland, hypoplasia of the cardiovascular system and peculiarities of configuration, with frequent sudden death." Results of the condition are various, among them are: (1) Liability to sudden death—this may be from anaphylaxis, cerebral haemorrhage, or, in young children, pressure on the trachea by the enlarged thymus gland. (2) Increased susceptibility and decreased resistance to acute infections. (3) Increased danger in childbirth. (4) Psychical instability; these subjects forming a large proportion of cases of drug addiction and suicides.

The most circumstantial account of the condition is given by Hewer (1953). According to him the findings of Kemp (1932), Campbell (1937), Moncrieff (1938), and the late Sir Bernard Spilsbury, in spite of several attempts to discredit their work, have definitely established the existence of the syndrome. It would seem that Hewer bases his case that status lymphaticus exists as a clinical entity upon three claims: (1) that the condition has been recognized for some 300 years; (2) that there is a recognized clinical picture with three classical signs; and (3) that there are well-recognized post-mortem findings. I propose to show that not one of these claims is supported by the available evidence.

Attitude of the Textbooks

In contrast to the above the attitude of the textbooks of pathology is much less positive, although the writers of such works must have much greater experience of the post-mortem findings in such cases; or is it for just that reason that their attitude is one of doubt or of definite scepticism?

Thus Boyd (1947) states that "there is no proof that the thymus gland has anything to do with stoppage of the heart." Dible and Davie (1950) state: "There is no doubt that ignorance of the great variation in size to which the thymus gland is subject in health and disease has often led to an unjustifiable resort to the convenient diagnosis of status lymphaticus in cases of sudden death. . . . Many pathologists of experience are of the opinion that there does exist some abnormal constitution or condition which is associated . . . with a liability to sudden death from relatively trivial stimuli, such as excessive sensitivity to stimuli of the autonomic nervous system, but no constant anatomical or pathological abnormality." Muir (1951) quotes the findings of the Joint Committee of the Medical Research Council and of the Pathological Society of Great Britain and Ireland, its general conclusions being that the facts that have been ascertained afford no evidence that the so-called status thymo-lymphaticus has any existence as a pathological entity.

The conclusion in Muir's textbook is that "this does not imply that there is not a constitutional condition of low resistance power, with a tendency to sudden death; simply that it is not possible to relate it definitely to thymic or lymphoid hyperplasia."

Green (1949) states that there are "no manifestations of the condition during life, but violent exertion, rapid temperature change or anaesthesia may lead to sudden death," and, finally, "it has been agreed that status lymphaticus

as a pathological syndrome, based upon pure thymic dysendocrinism, does not exist."

If Dr. Hewer's story were correct we should expect to be able to follow these references to status lymphaticus back to the earliest editions of current works and further back still in the earlier editions of books now out of print but in being before Osler's *Medicine* was produced.

Ewing and the Vienna School

Actually there is no reference to the condition in Osler's first and second editions, or in any contemporary medical or pathological book I have been able to discover such as Fagge (1888, 1891), Bristowe (1890), Roberts (1873, 1890), Taylor (1890), or Coats (1895); in fact, it is not until the third edition of Osler's *Medicine*, published in 1898, that any reference is made, and then in these terms: "Much attention has been paid lately to a somewhat rare condition . . . ". and the reader is advised to consult an article by Ewing (1897).

Ewing in discussing the views of Paltauf (1889) begins: "There have recently been described a series of cases . . . ."; he continues, "The importance of the constitutio lymphatica and its relation to some forms of sudden death, especially to fatalities under chloroform narcosis, have been recognized by the Vienna school of pathologists, but have received very scant attention elsewhere."

Six successive editions of Osler's *Medicine* carried the passage based upon Ewing's article but without his final sentence, which ran: "In conclusion, while the studies of the Vienna observers seem to have placed the existence of the constitutio lymphatica upon a firm basis in pathology, the observations yet remain far too limited fully to demonstrate the truth of an hypothesis which connects a large class of sudden deaths with simple hyperplasia of the lymphatic structures of the body."

It is surely significant that Paltauf makes no mention, in a long list of references, to any work published earlier than 1850; equally so that John Simon (1845)—although his bibliography is immense, going back as far as Galen and Rufus of Ephesus—seems entirely to have missed this historical association.

Growth of the Legend

The history of the growth of the legend of status lymphaticus can be quickly told; gradually during the first decade of the twentieth century the idea of a status lymphaticus began to spread, so that in the eighth and ninth editions of Taylor's *Practice of Medicine*, in 1908 and 1911, references begin to appear, and in 1911 for the first time a separate entry of diseases of the thymus gland makes its appearance in the annual report of the Registrar-General for England and Wales.

In 1917 Dr. Symmers, professor of pathology at the Bellevue Hospital, New York, published an original work upon status lymphaticus in which he recorded the weights of the thymus gland in 66 cases out of 249 which he had diagnosed "status lymphaticus."

The weakness of Dr. Symmers's case is that he publishes no standard for normal weights of the thymus gland, and if we compare the weights of his enlarged glands with the normal weights arrived at by Hammar (1916), or by the Medical Research Council's Joint Committee (1931), whose findings were based on a much larger published collection, we find that a preponderance of these abnormally heavy glands of Dr. Symmers's fall within these other observers' normal weights.

However, Dr. Symmers's views have gained much popularity and have formed the basis of the description of the condition in Osler's *Medicine* from the eighth edition, of 1920, to the latest, the sixteenth, published in 1947.

Platter's Observations

Felix Platter's name does not appear in connexion with status lymphaticus until 1925, although his name was brought to the attention of American medical men some years earlier by C. G. Cumston (1912), who quoted some extracts from Platter's memoirs and from some other papers of his still preserved in the museum of his native Basle.

In 1925 Ruhräh gave a short sketch of Platter's life and the text of a short article to be found in his *Observationum in hominis affectibus*, together with an English translation (not without error). Ruhräh's own comment was: "To paediatrics we know he made one contribution of great value, the description of thymus death; like many first descriptions of disease it is contained in a few words."

Marine (1928) referred to this observation of Platter's, and in 1932 Kemp began a long original article upon status lymphaticus with Ruhräh's translation of the paragraph from the *Observationum*—error and all.

The first edition of Hewer's *Recent Advances in Anaesthesia and Analgesia* appeared earlier the same year, I presume, since there is no reference in his work to Platter's observation; but in the second edition, published in 1937, Platter's article is quoted and the legend of the 300-year-old tradition is fairly launched in British medical literature; although one tentative diagnosis at one post-mortem examination is perhaps rather scanty material. From the fourth to the latest (the seventh) edition of *Recent Advances* the date of Platter's article has been placed in 1641; one can only say what a remarkable old gentleman Felix Platter must have been to have published his three volumes of clinical reminiscences at the age of 104. However, there can be little doubt that the date of his death as given on the plaque in Basle Cathedral—July 28, 1614—is the correct one; the 1641 edition of the *Observationum*, a copy of which is to be found in the library of the Royal Society of Medicine, is really only a reprint of the work brought out a few months before the author's death in 1614.

"Classical" Signs

With regard to the "classical" clinical signs—those of Sergent, Schridde, and Orroya—they are mentioned for the first time by Kemp (1932), who quotes no case notes to support his statements; no other writer records cases presenting these physical signs, nor that of Madan; while the three leading medical dictionaries—Dorland's, Stedman's, and Blakiston's "New Gould"—make no reference to Orroya or to Madan.

Campbell (1937) lists an impressive number of physical signs, far too numerous to be mentioned here, associated with status lymphaticus, but, like Kemp, fails to favour us with any case records.

As to Sir Bernard Spilsbury's post-mortem findings in status lymphaticus, I have been completely unsuccessful in my attempt to discover any published work in which such findings are quoted. In 1926 there was set up a Joint Committee of the Medical Research Council and of the Pathological Society of Great Britain and Ireland, which published its report in 1931; some 680 post-mortem examinations were made, and the care and detail with which these cases were analysed place this investigation in a class by itself. Hewer (1953) relegates all reference to this committee's report to a footnote, it being apparently one of "several attempts [that] have been made to discredit the existence of the condition," and prefers to base his belief upon the views of Kemp, Campbell, Spilsbury, and Moncrieff, although the last-named alone of these four quotes any case notes—those of seven children, none of whom are reported as having died but whose thymus glands are diagnosed as enlarged by *x*-ray photography—a somewhat unreliable basis, as the writings of Garland (1929) and of Capper and Schless (1934) have emphatically shown.

I suggest that were this account of status lymphaticus other than a fable ample material in support could have been found among the thousands of post-mortem examinations reported since 1945 by Helperm and Rabson (1945), Keith Simpson (1947), Richards, (1947), Deadman (1947), and others, or from among the odd 200 deaths reported annually by the Registrar-General for England and Wales.

Conclusion

In conclusion, until some such evidence is produced we must surely accept, as does Professor Weiss (1940), that instantaneous physiological death occurs, but is not associated with either clinical or pathological signs, that the twelve conclusions of the Joint Committee remain the considered judgment of informed opinion, and that the last sentence of their report holds good: "In the opinion of the Joint Committee the facts elicited in the present inquiry are in harmony with those of Hammar (1926, 1929), and of Greenwood and Woods (1927) in affording no evidence that so-called status thymo-lymphaticus has any existence as a pathological entity."

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Nova et Vetera

"THE NAPOLEON OF SURGERY"

Medical students' notebooks written in the more leisurely days of the last century or earlier sometimes provide little-known facts about their teachers, the state of contemporary medical education, and the day-to-day events, all so valuable to the historian who comes after.

Professor Charles McNeil recently published[1] some excepts from a notebook kept by his father, William McNeil, in the year 1861. At that time William was a student of James Syme, the Edinburgh surgeon, and the importance of the notebook is that it brings back to life some of the words and acts of Syme at the height of his achievement and influence.

Before the advent of anaesthesia Syme already had a reputation for conservatism in surgery. He was neither quick nor brilliant as a technician, but he always insisted on scrupulous cleanliness at operations. In 1829, having failed to obtain an appointment on the surgical staff of Edinburgh Royal Infirmary, he opened a small surgical clinic at Minto House, where he rapidly built up a reputation second to none in Europe. His lectures were always crowded, and he was received by his assistants and students like a monarch. Alexander Miles has called him "the Napoleon of surgery." His pupils included Lawson Tait and Joseph Lister, who both inherited his zeal for surgical cleanliness and who were afterwards to diverge so widely in their methods of developing it. Lister later married Agnes, Syme's daughter.

An earlier pupil (in pre-anaesthetic days) was John Brown, later to distinguish himself as an essayist. His sketch *Rab and His Friends* immortalized the little hospital at Minto House. Syme was the surgeon who operated on Ailie for a cancer of the breast, who "dressed her [wound], and spoke to her in his own short kind way, pitying her through his eyes."

Professor McNeil has included sufficient extracts from the notebook to show the setting in which a great surgeon worked 90 years ago. "Beside him are his assistants—the house-surgeon and dressers; around, on the crowded benches his students, attentive and admiring; over the head of the surgeon bending to his work the invisible but felt aura of his experience and reputation." The patients, too, are not mere cases, but become living creatures, like the little girl from Wales, aged 8, who "seemed in the very highest spirits, was carrying a large doll very gaily dressed, and laughed immoderately at the round of applause with which the students greeted her appearance." There is also the man with cancer of the scrotum who did not reply when Syme asked whether or not he would like chloroform.

"Pr. [Professor] Syme with a pair of scissors at once cut out the cancer which was situated in the most dependent part of the scrotum. The shouts of the fellow were terrific. Pr. Syme, after he had completed the tying of the vessel cut, questioned him concerning the period of its growth, and got for a reply: 'Hoo the devil can I answer ony questions just noo?' This created a very hearty laugh among the students, which did not improve the temper of the patient. He left the theatre uttering imprecations on Pr. Syme and all concerned."

The callousness of surgeon and students sometimes implied by the notes is, as Professor McNeil points out, countered by the sympathy and pity for the patient so well expressed in *Rab and His Friends*: "Don't think them heartless; they are neither better nor worse than you or I: they get over their professional horrors, and into their proper work; and in them pity as an *emotion*, ending in itself, or at best in tears and a long-drawn breath, lessens, while pity as a *motive* is quickened and gains power and purpose." And again, after the operation on Ailie: "It is over; she is dressed, steps gently and decently down from the table, looks for James; then, turning to the surgeon and the students she curtsies, and in a low, clear voice, begs their pardon if she has behaved ill. The students—all of us—wept like children."

With the notebook we can picture the dramatic scene in the surgical theatre 90 years ago; on the stage the surgeon, assistants, and patients; in the audience the students, with eyes and ears directed to the stage, where Syme dominates the scene and conducts the play.

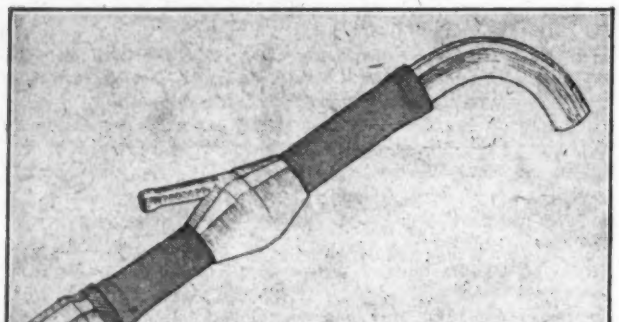
[1] A Student's Notebook of James Syme's Class of Clinical Surgery in 1861–62. Kept by William McNeil, M.D.Ed. 1864: with Extracts and Comments by Charles McNeil. *Edinb. med. J.*, 1952, **59**, 266.

Preparations and Appliances

AUSCULTATION IN ANAESTHESIA

Dr. J. D. LAYCOCK, consultant anaesthetist at St. Thomas's Hospital, writes: During thoracic operations it is important for the anaesthetist to be able to detect with ease the presence of secretions in the bronchial tree so that he may pass a suction catheter and remove them. A large amount of secretion may be recognized by an audible rattle which is not easily missed, but smaller amounts may pass unnoticed.

It seems that the most logical way to find out what is happening in the bronchial tree and whether there are secretions there is by direct auscultation. With this object I have designed a small appliance which can be fitted over the wide-bore rubber tube that leads from the anaesthetic apparatus to the endotracheal connexion. The appliance



is a metal cuff surrounding the rubber tubing and connected to a stethoscope which can be worn by the anaesthetist. Various shapes of cuff have been tried, but the most satisfactory has been the one shown in the drawing. This is made to fit firmly over the tube, and it is essential that the fit should be airtight, to prevent extraneous sounds from entering.

The application of the cuff, of course, interferes in no way with the gases passing through the rubber tube inside it. During normal respiration breath sounds similar to those heard over normal lung in clinical examination will be heard, but the sounds are distinctly louder when respiration is controlled or assisted, as is usual in thoracic operations. Kinking of the endotracheal tube causes a characteristic change in these sounds, and the appliance is thus a ready means of detecting even a slight degree of kinking. Bronchial secretions can be heard very easily. The tone of the bronchial musculature can be studied, and the wheezing of asthma or bronchial spasm can be noticed even if very slight.

There is probably no simpler or more certain way of checking up on the state of the bronchial tree and its contents at any stage of the operation, and if bronchial secretions are present they can be recognized at once and dealt with by suction. The efficiency of the suction can be checked by listening again afterwards. The cuff may be used with advantage in general surgical operations where information regarding the tone of the bronchial tree, or secretions within it, is likely to be of value.

The appliance is manufactured by Blease Anaesthetic Equipment Ltd., 12, Hinde Street, London, W.1, and is supplied complete with a wide-bore rubber tube fitted with a universal catheter mount for connexion to the anaesthetic machine. I am grateful to Miss J. Davenport for the drawing.

A SIMPLE INDICATOR FOR EXTRADURAL ANALGESIA

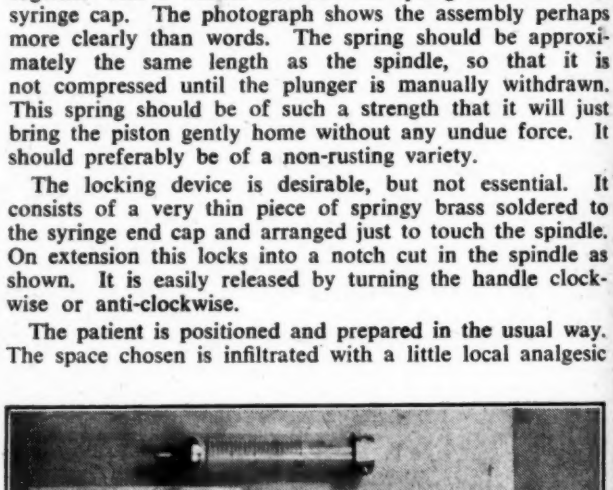
Dr. G. A. JACKSON, anaesthetic registrar, Plymouth Hospitals, writes: The extradural potential space is often difficult to demonstrate with certainty, using negative pressure and other methods. Iklé described a syringe and method (*British Journal of Anaesthesia*, 1950, 22, 150) which gave a more positive approach to the problem, it being an improvement on the Dogliotti technique. In our hands it had one disadvantage: it was not always easy to place the needle-point in the interspinous or ligamentum flavum in such a position that the strong spring in the syringe did not sometimes force the saline indicator to leak into the tissues. This might happen before the extradural space had been demonstrated. It occurred mostly in the obese, who presumably had poor ligaments which were to some extent infiltrated with fat. When it does happen a good method is rendered useless.

The syringe to be described overcomes the difficulty completely by using a weaker spring. It is simple and costs very little. It has been used with entire success in very many cases. An extradural block is now as easy and reliable to administer as a spinal analgesic.

A 2-ml. Record-type syringe is very simply modified and acts solely as an indicator. A small compression spring is fitted on the spindle between the piston and the handle, together with a washer between the spring and the metal syringe cap. The photograph shows the assembly perhaps more clearly than words. The spring should be approximately the same length as the spindle, so that it is not compressed until the plunger is manually withdrawn. This spring should be of such a strength that it will just bring the piston gently home without any undue force. It should preferably be of a non-rusting variety.

The locking device is desirable, but not essential. It consists of a very thin piece of springy brass soldered to the syringe end cap and arranged just to touch the spindle. On extension this locks into a notch cut in the spindle as shown. It is easily released by turning the handle clockwise or anti-clockwise.

The patient is positioned and prepared in the usual way. The space chosen is infiltrated with a little local analgesic



and the skin pierced with a cutting needle. The syringe is filled with saline and locked. A fine lumbar-puncture needle is inserted in the usual fashion in the midline for about 1 in. (2.5 cm.) until it is felt to be firmly gripped by the interspinous ligament. The syringe is attached and unlocked. No saline should leak into the ligaments. The needle is very slowly advanced until the saline is automatically ejected into the extradural space. The needle-point is now just in the space, and the advancing saline tends to push the dura mater away from the advancing needle-point without damage.

The syringe is disconnected after several aspiration tests for cerebrospinal fluid. Should a small amount of saline emerge from the needle it should be felt on the back of the hand or on the wrists. It will be cold as compared with warm cerebrospinal fluid. The analgesic solution is now slowly injected.

This method has been used in Plymouth for some time now without dural puncture. In fact, latterly, test doses have been omitted with perfect safety and with a great saving of time. Lignocaine hydrochloride 1–1.5% is used in varying quantity.

The syringe will be obtainable from Medical and Industrial Equipment Ltd.

I should like to thank my senior colleagues for their most helpful criticism and advice while this technique has been devised.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Press Publicity

SIR,—In two very recent instances my name has appeared in the daily newspapers in relation to patients. The embarrassment which has attended such publicity is a private affair of mine, but there have been aspects of the contacts between my department and the press which have raised very much broader issues covering the whole field of the relationship between medicine and the press.

In the first of these instances intimate medical details have been obtained by medical correspondents of newspapers and have been published sometimes with mathematical accuracy so that an almost complete picture of the medical course of the case could be built up, and indeed has been built up, exclusively from press cuttings. The great majority of these details, and all the minor details, have been unofficially obtained.

In the second case, news of a procedure which had been developed in my department was reported in the press with the names of the doctors concerned. This information had also been obtained through what doctors would regard as irregular channels. Several inaccuracies in this report were embarrassing and I had to enlist the good offices of the Press Association to publish a short true account without mention of names of doctors or hospitals.

What we doctors do not sufficiently realize is that reporters in general believe that it is perfectly legitimate to collect medical news by any means available to them and that any method of collection is entirely legitimate and honourable. We have up to date not admitted this premise, but on the other hand have held strictly to the rule that medical information should be communicated by a doctor only through the columns of a medical or scientific journal. This ideal method of presentation of medical news is to my mind no longer attainable, and by attempting to attain it we are inviting for ourselves and for our patients all the inconvenience and even dangers which attend the uncontrolled competitive search for medical news by professional journalists. During the past few weeks we have in this medical school suffered this inconvenience in an extreme degree.

I do not wish to stress the private inconvenience which my family and I suffered. It is sufficient to say that on one evening the police had to be called to clear the precincts of my home of objectionable men who claimed to be reporters but who from their behaviour at a late hour and in the darkness may well have had more felonious intentions than the collection of news, but there may in fact, from this situation, be an actual danger to the patient. The patient himself, or his relations and friends, may be dismayed by the reports they read of an operation still to be faced and openly described in the press with an unbalanced estimate of the dangers attendant upon it. Patients awaiting treatment by new techniques may be extremely disturbed by an inaccurate lay record of its details. This is the most serious effect of inaccurate medical reporting in the public press and I have experienced how potent that effect may be. Press publicity may also affect a patient indirectly; it does not make it easier for a surgeon to decide to undertake a dangerous or novel operation in the full glare of hourly publicity. Not only the press reports but the technique for the collection of news has its effect too. The relatives of patients may be subjected to a constant degree of press interest which amounts almost to persecution. Working conditions may become almost intolerable in a hospital invaded by dozens of reporters competing for exclusive news and by crowds of press photographers who consider that they have the right to photograph almost any clinical situation, who enter wards almost indiscriminately if they can, and who, if they are refused entrance, try to take pictures through the ward windows. Added to all this there is the effect on the morale of the staff of the hospital in these circumstances; natural professional reticence has to be replaced by an overconscious sense of the need for security, and if leakage occurs an atmosphere of suspicion may develop; leakage is almost inevitable in a community where many of the relevant medical facts are known to hundreds of people.

It would seem that with increasing newspaper appreciation of the public interest in fresh medical news the best that we can hope for is that our individual anonymity will be preserved and that any reports that are issued are accurate and unharmful. The press requirement for news can in fact be relatively easily satisfied, and once it is satisfied all persecution ceases. In one of the cases I have mentioned part of our responsibility was to a great public company. This company offered us the services of its public relations office, and as soon as we took advantage of these the whole situation improved immeasurably. All press inquiries were canalized through that public relations office. I satisfied ethical requirements by not giving any information whatever to the press directly but by giving the company concerned a report of their patient from time to time, and at their discretion they furnished what particulars they thought were suitable to the press. I believe that my hospital and I could have remained anonymous if the press had not already been in possession of my name before the arrangement with that company was made.

If a route of this sort were available for hospitals to provide the press anonymously with a certain amount of information, and if opportunities were permitted for the press to ask those questions which they consider publicly important through an intermediary, my recent experience with the press suggests that the newspapers in return would go a long way towards preserving our wishes about anonymity and about the date of publication of medical matter.—I am, etc.,

Hammersmith, W.12. IAN AIRD.

Sensitivity to P.A.S.

SIR,—In view of the recent reports of allergy to *para*-aminosalicylic acid in the journals, and the widespread use of this drug in the treatment of tuberculosis, the following example of sensitivity to P.A.S. may be of some interest. The sequence of symptoms, fever, depression of the white cell count of the blood, and later urticaria, was quite definite.

A Chinese nurse, aged 24, single, was admitted to hospital on September 29, 1953, complaining of vague ill-health, loss of weight, and a bad family history of tuberculosis. Examination was negative except for tenderness deep in the right loin. Laboratory findings were: red cells, 4,370,000 per c.mm.; Hb, 11.9 g.%; white cells, 4,800; blood film, no malaria parasites seen; urine, S.G. 1017; faint trace of albumin; sugar, nil; *x*-ray of lungs, N.A.D. An intravenous pyelogram showed normal excretion, but the lower end of the right ureter as high as the pelvic brim appeared double. At retrograde pyelogram the ureteric catheter could not pass beyond the "double" part of the right ureter, but radio-opaque injection in this position filled *both* "arms" of the "double" section.

A 24-hour specimen of urine, when centrifuged, showed acid-fast bacilli resembling *M. tuberculosis* in all respects, and guinea-pigs were inoculated. This examination was repeated twice more with similar results.

On October 13, going by the excellent results obtained with this therapy in pulmonary tuberculosis here, the patient was started on P.A.S. 2 g. four-hourly, and isoniazid 50 mg. twice a day, this latter being increased to 100 mg. twice a day on October 22. On this day, in the evening her temperature rose to 100° F. (37.8° C.), to 103° F. (39.4° C.) on October 23, and again on October 24 to 103° F. (39.4° C.). All treatment was stopped on the morning of October 24 and crystalline penicillin G 80,000 units four-hourly started. White cell counts were as follows:

October 23, 4,200; October 24, 3,200; October 25, (a.m.) 3,000, (p.m.) 4,400; October 26, (a.m.) 3,800, (p.m.) 4,600; October 27, 4,600; October 29, 4,000; October 30, 5,600; November 9, 6,400 per c.mm.

All differential counts showed a normal distribution of cells, despite several repeated examinations to detect a true agranulocytosis. She was apyrexial by October 26, and the penicillin was stopped on the 28th. On November 8 a desensitizing course

of both drugs was commenced—one dose of P.A.S. 50 mg. and one of isoniazid 5 mg. being given. There was an immediate flare-up of temperature to 99.2° F. (37.3° C.) and mild urticaria. On November 9 P.A.S. 25 mg. *only* was given with a similar recurrence of symptoms, plus swelling of the face and a "lump in the throat." Symptoms were controlled quickly with antihistamines and adrenaline.

On November 10 a patch-test with P.A.S. 1% aqueous solution was strongly positive after four hours (a control was used). On November 11 the girl was started on isoniazid 50 mg. twice a day without any ill effects, this later being increased to 100 mg. twice a day, as well as injections of dihydrostreptomycin.

—I am, etc.,

Sarawak. K. F. D. SWEETMAN.

The Diploma in Public Health

SIR,—The discussion which follows Dr. Max Park's remarks on the curriculum for D.P.H. (*Journal*, October 3, 1953, p. 778) is both instructive and inspiring. An elaboration of comprehensive curriculum leading to the D.P.H. is a very responsible task, as its ultimate aim is to secure success for the diplomad, and, through this, ultimate good for the community in which he is working.

A few years ago I attended the D.P.H. course in London, and after its completion I worked in Canada and the States. The course is divided in two parts: the preliminary part, leading to C.P.H., and introducing comprehensively the basic subjects and the historical background of public health, the syllabus of the second part being based on the student's direct and very active participation in the course. His duties are not only to listen and to learn, but to observe, to report, and to share his experience with his classmates and instructors during frequent class discussions or special seminars. Elective subjects and studies were encouraged according to the student's liking. Many problems are illustrated through excellently diversified field-visits and field-work. In retrospect, I recollect that course as a splendid example of instructors' and students' co-operation, based on the promotion of better human relationships and the application of the medical and scientific achievements to public health.

It must be extremely difficult for the committee responsible for the D.P.H. curriculum to decide what subjects should be actually taught and for how long. While the main object of public health is still the same as it was in Chadwick's and Shattuck's time, yet the tools and ways for its achievements have changed almost completely. In addition to epidemiology, sanitation, medical statistics, and public health administration, the sound knowledge of paediatrics, nutrition, psychology, and psychiatry is very indispensable to the public health physician working with a progressive community. The study of human relationships seems to be of the utmost importance, and it should be included in the curriculum besides the detailed studies of the environmental and genetic factors.

The idea of elective subjects introduced some time ago at the London School of Hygiene and Tropical Medicine features also the possibility of extending knowledge in particular subjects during the D.P.H. course. This, indeed, is proving to be very useful, as many public health physicians are performing duties limited to the special fields, as in the case of school medical officers, epidemiologists, haematologists, nutritionists, public health paediatricians, public health psychiatrists, etc. This trend and need for specialization within public health medicine may support the view that the curriculum for D.P.H. should be changed appropriately, and elective subjects extended to the various "specialties" within the public health curriculum.

It may also have to be considered seriously at the same time that not only the D.P.H. curriculum but also its name and the name of the diploma should be changed; likewise the name M.O.H. should be replaced by P.H.P., or public health physician.—I am, etc.,

Boston, Mass. L. L. KULCZYCKI.

What is Enpepilo?

SIR,—I would suggest that the answer to Dr. J. Cauchi's interesting query (*Journal*, December 19, 1953, p. 1378) is "erysipelas." If the late Robert Rawlinson, C.E., took the statement quoted in Dr. Cauchi's letter from a medical report, it would, at that time, have been in manuscript and probably written in the traditional obscure handwriting of a doctor.—I am, etc.,

Pangbourne, Berks. ERIC DONALDSON.

Post-operative Backache in Women

SIR,—As a general practitioner I welcome Dr. E. Schleyer-Saunders's memorandum on post-operative backache in women (*Journal*, January 2, p. 28).

Before the use of relaxants in anaesthesia very few of my patients suffered in this way, but during the last 6–7 years there has been a succession of such cases in my practice, nearly all following operation or examination under anaesthesia in the lithotomy position. The most difficult have been those with symptoms of sacro-iliac subluxation, which have sometimes resisted prolonged treatment or relapsed at intervals, a characteristic sequel when those joints have been disturbed.

I have assumed that the lifting or lowering of one leg at a time has produced a torsion strain on a sacro-iliac joint in the absence of any protecting muscle tone. In many cases the backache has been only moderate in degree during the few days in bed and accepted up to a point by the patient, often without saying much about it in the ward. It is on returning home that the pain and fatigue are indignantly complained of, and all the more so if the operation in question was a trivial one. This condition may in fact be more familiar to the family doctor than to the gynaecological departments, which have sometimes disclaimed any responsibility in causing it.

A change in theatre drill and organization on the lines suggested in the memorandum would probably abolish this very troublesome and increasingly frequent sequel to operations which would otherwise be followed by the briefest convalescence without discomfort or disability.—I am, etc.,

London, W.2. ANNIS GILLIE.

The Accident-prone

SIR,—In the conclusion of his illuminating study of "The Accident-prone in General Practice" (*Journal*, December 12, 1953, p. 1306) Dr. R. M. McGregor refers to the importance of parallel studies. One such study, just published, by J. M. M. Hill and E. L. Trist,[1] is unlikely to come to the attention of your readers and may be briefly summarized here.

The study was of detailed four-year work records in a large iron and steel works. In such industrial studies it is possible to relate "withdrawal from work" due to sickness to that due to accidents and to what is known as "voluntary absence." Hill and Trist (in agreement with Dr. McGregor) find a positive correlation between absence due to accident and that due to sickness; but with the aid of additional figures they have shown an even stronger correlation between accidents and "voluntary absence." The work concerned is to be continued and offers strong evidence of the need to extend current studies in this field to include the characteristics of the social relationships of the individual, both in his work situation and elsewhere.—I am, etc.,

London, W.1. A. T. M. WILSON.

REFERENCE

1 "A Consideration of Industrial Accidents as a Means of Withdrawal from the Work Situation," *Hum. Relat.*, 1953, 6, 357.

SIR,—I should like to pass certain comments on the article by Dr. R. M. McGregor entitled "The Accident-prone In General Practice" (*Journal*, December 12, 1953, p. 1306).

Urban dwellers are more accident-prone than countrymen.—Dr. McGregor assumes that all accidents in his practice are reported to him. Surely he realizes that the countryman, for reasons of distance and self-sufficiency, bred in the days of necessity when medical aid was not available, does not report many of the minor accidents that the urban dweller living near his doctor does. I suggest that it is this fact that Dr. McGregor's figures prove, and not, as he deduces, that the urban people are more accident-prone than the rural.

Existence of accident-prone people.—Surely it is agreed that clumsy people meet with more accidents than do the skilful. However, Dr. McGregor's figures do not prove

this; but rather that a man who reports one accident will report another, while another man would treat both himself and report neither to the doctor.

The accident-prone are illness-prone.—The figures given do not prove the above contention, but rather confirm my view that there are doctor-conscious patients who report every bruise or cold and self-reliant patients who do not trouble the doctor over trivialities.

Sex ratio of patients.—A cardinal factor affecting the reporting of accidents is the need for a certificate. Since Dr. McGregor does not confine his figures to insured persons, and since there is a much higher proportion of men insured than women, Dr. McGregor's conclusion regarding the sex ratio of accidents is invalidated.

Change in sex ratio of accidents over 45 years of age.—May this not be apparent rather than real? I would suggest that many women under 45 have young children, and consequently ignore their minor accidents so that they can carry on their domestic responsibilities, whereas women over 45 have reached a stage in life where their duties are less onerous and they can indulge in the luxury of a little fuss, sympathy, and a trip to the doctor.—I am, etc.,

Wantage. D. LEIGH.

Malaria Prophylaxis

SIR,—In view of the present interest in the new antimalarials, I am sending you a record of two families here who have been taking pyrimethamine ("daraprim") 25 mg. weekly during the malaria transmission season, which has been more severe than usual owing to exceptionally heavy rains. Malaria here is almost entirely malignant subtertian variety.

One family, that of the writer, who personally supervised the administration of the drug, consists of three English adults and three children under 4 years (non-immunes) and four Sudanese servants (immunes). All the adults, including the servants, have had pyrimethamine 25 mg. regularly once a week. The children have had half a tablet (12½ mg.) once a week. Four weeks after taking pyrimethamine, W. P., aged 2½ years, English (never had malaria), became irritable and feverish, temperature 99.4° F. (37.4° C.) (axillary), blood film: positive malignant tertian malaria. Cured by taking mepacrine ("atebrin") ½ tablet twice a day for five days.

After three months of continuous pyrimethamine prophylaxis, the following also had malaria: M. P., age 30, English (never had malaria), complained of severe headache. Temperature 100° F. (37.8° C.). Blood film: positive malignant tertian malaria. Cured with mepacrine (1 tablet three times a day) for five days; S. S., age 18, English (never had malaria), complained of cold for three days and severe headache. Temperature 99.4° F. (37.4° C.). Blood film: positive malignant tertian malaria. Cured with mepacrine (one tablet three times a day) for five days; R. P., age 10 months, English (never had malaria), cross and irritable for two days. Temperature 99.6° F. (37.55° C.) (axillary). Blood film: positive malignant tertian malaria. Cured with four intramuscular injections of quinine; J. P., age 35, English (had malignant tertian malaria once before in 1946). Temperature 102° F. (38.9° C.) Headache. Blood film not taken. Cured with camoquin (three tablets on first day and two on second day); A. N., Sudanese (Nuba), age about 34. Complained of cold and headaches for two days. Temperature 99.8° F. 99.4° F. (37.4° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine; K. K., Sudanese (Nuba), age about 21, complained of pain in back and chest. Temperature 101° F. (38.3° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine; O. I., Sudanese (Darfuri), age about 26, complained of diarrhoea for two days. Temperature 99.2° F. (37.3° C.). Blood film: positive malignant tertian malaria. Now having mepacrine (one tablet three times a day); H. W., Sudanese (Darfuri), age about 55 years, complained of fever. Temperature 100° F. (37.8° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine.

The other family consists of two English adults and three children under 5 years. The adults have been taking pyrimethamine 25 mg. weekly, and two of the children half a tablet (12½ mg.) weekly, since their arrival from England in July, 1953. E. H., age 34, English. Temperature 99.6° F. (37.55° C.). Complained of diarrhoea. Blood film: positive malignant tertian malaria. After taking mepacrine 1 tablet three times a day for five days, a second blood film was positive. She was then given four intramuscular injections of quinine; R. H., age 38, English (has had malaria before). Temperature 99.8° F. (37.7° C.). Complained of headache and lack of concentration. Blood film: positive malignant tertian malaria. Cured with camoquin three tablets on the first day, followed by two tablets on the second day; A. H., age 5, English (never had malaria before). Cross and irritable and mild diarrhoea. Temperature 99.4° F. (37.4° C.). Blood film positive malignant tertian malaria. Cured with mepacrine ½ tablet twice a day for five days; C. H., age 3, English (never had malaria). Temperature 99.8° F. (37.7° C.). Blood film: positive malignant tertian malaria. Cured with camoquin one tablet followed by one tablet on the following day; C. H., age 9 months, English, did not take pyrimethamine until a month ago when she had malaria, which was cured with four intramuscular injections of quinine. After that she had ½ tablet weekly for two weeks. Following this she again had diarrhoea. Temperature 99.4° F. (37.4° C.) (axillary). Blood film: positive malignant tertian malaria. Cured by intramuscular quinine.

Only one person in these households has not had malaria since taking pyrimethamine: E. P., age 4 (E. P. had a typical attack of malaria four months ago before taking pyrimethamine. Temperature 102° F. (38.9° C.) (axillary) with delirium). All the attacks have been mild and all the cases ambulant. One patient (E. H.) failed to respond to mepacrine therapy and had to have quinine. The two infants had quinine as they could not take mepacrine. Three Sudanese servants expressed a preference for quinine injections. Proguanil has been used prophylactically by a few English and Greek families resident in this area during the post-war period. The number of local Sudanese families taking the drug is probably less than 1%.

Although it appears to mitigate the attack, pyrimethamine in the dosage given appears to be quite inadequate in preventing attacks of malignant tertian malaria in Dueim.—I am, etc.,

Dueim, Sudan. MARY G. PHILLIPS.

Partial Hepatectomy

SIR,—I read the very refreshing article by Sir Heneage Ogilvie on partial hepatectomy (*Journal*, November 21, 1953, p. 1136) with great interest, and I was particularly impressed by his description of a simple but extremely effective technique which I have never seen in use nor previously heard described. Apart from the subject of biopsy little has been published about partial hepatectomy either in connexion with malignant disease or otherwise. In this connexion the following case, with whose treatment I assisted Professor Mercer several years ago, is of interest.

A man, aged 64, complained of pain, sickness, severe borborygmi, flatulence, and diarrhoea for two and a half years. On examination he demonstrated the features of subacute small bowel obstruction and visible peristalsis was noted. Barium meal examination, with follow-through, showed an incomplete hold-up at the lower end of the ileum. Laparotomy revealed an almost complete obstruction at the lower end of the ileum of the string stricture type. The tumour was solitary, there was a little free fluid, but there was a superficial nodule approximately the size of a pigeon's egg on the lower part of the anterior surface of the right lobe of the liver. Resection and anastomosis of the affected portion of the bowel and its mesentery was carried out. The pathological report stated that the tumour was a carcinoid. In view of the accessibility of the only detected metastasis it was decided to excise the nodule from the liver. This operation was accordingly successfully performed 20 days later. The tumour was excised by diathermy and the cut liver edges exposed by deep sutures. The pathologist reported malignant carcinoid. The patient was discharged 16 days later and his doctor has written to say that he remained in good health, and fit for work, for over three years. Subsequently liver enlargement became evident and he eventually died three and a half years after operation.

Although the long-term result, in this case, was unsuccessful, the patient at least enjoyed a further three years of active life, and one can only speculate that probably he would not even have enjoyed this period if the liver nodule had not been removed.—I am, etc.,

Kirkcaldy. WM. DRUMMOND.

Studies on Pancreatitis

SIR,—I read with much interest the instructive article "Studies in Pancreatitis" (*Journal*, December 19, 1953, p. 1335), and the authors are to be congratulated on endeavouring to throw some light on the vexed problems concerning the surgery of the pancreas.

However, few would agree that in cases of acute pancreatitis "if an occasional laparotomy is needlessly performed little harm to the patient is likely to follow." The consensus of opinion is that operative interference in acute pancreatitis carries a mortality of 30%, as compared with 3% treated symptomatically, and who are mostly fulminating cases who are doomed whatever may be done. Therefore every precaution must be taken to avoid laparotomy, even in the occasional case, and a valuable physical sign in acute pancreatitis is tenderness over the left renal angle—i.e., over the tail of the pancreas.

I have for many years been interested in the difficult problem of the "post-cholecystectomy syndrome," to which I have referred in a recent article.[1] My experience agrees with those expressed by the authors, with one exception. I believe that spasm, or even fibrosis of the sphincter of Oddi, is a definite clinical entity, manifested by recurrent attacks of dyspepsia, colicky pains, and even slight jaundice. These attacks are usually relieved by pethidine, but, if they incapacitate the patient, division of the sphincter, preferably by means of a sphincterotome, not only relieves back pressure on the liver but also provides drainage of the main pancreatic duct, and thus lessens the risk of progressive infection. I have performed this operation on 14 patients, in 10 of whom symptoms were entirely relieved, and the remaining 4 were improved sufficiently enough to be grateful.—I am, etc.,

London, W.1. MCNEILL LOVE.

REFERENCE

[1] *Brit. J. Surg.*, 1952, **40**, 214.

Appendicitis in the Course of Measles

SIR,—The article by Dr. W. H. Galloway on this subject (*Journal*, December 26, 1953, p. 1412) is of interest to all who have to deal with children, and especially those who have the difficult task of deciding whether the appendix of a young child is inflamed or no. There seem to be three points of importance.

(1) It might be better to separate off a group and call it pseudo-appendicitis. In Dr. Galloway's seven cases all the appendices were removed, but two were "apparently normal," one showed "slight redness," and one was "slightly inflamed." Lacking further details one can only suggest that these four were possibly removed unnecessarily. (2) In making a diagnosis, a count of the white blood cells may be useful. Dr. Galloway does not give his figures, but it is usual to find a leucopenia in early measles. I have notes of two cases which were seen last spring. They had both been admitted to hospital with the diagnosis of acute appendicitis. One, a boy of 7, had his appendix removed, and it was found to be covered with Koplik's spots but otherwise normal. A white blood count taken next day showed 7,500 cells per c.mm., of which 81% were polymorphs. The measles rash appeared two days later. In the other child, a girl of 4, the white blood count was 4,300, with 80% polymorphs. Operation was not performed; the rash appeared next day and she made a perfect recovery. (3) The routine use of sulphonamides in measles is important in *preventing* respiratory complications, especially in children under 3 years of age.

Obviously there are some cases where it would be dangerous to delay and exploratory laparotomy is essential; but as often as not the situation is not so grave and a period of observation in hospital with special attention to the search for Koplik's spots in the mouth and a white blood count may solve the problem without surgical and anaesthetic intervention.—I am, etc.,

Bath. H. R. E. WALLIS.

The College of General Practitioners

SIR,—I really cannot allow to pass unchallenged Dr. J. Inglis Cameron's remarks in the *Journal* of December 19, 1953 (p. 1376), on the future of the College of General Practitioners. While it is not my purpose to argue with his suggestion that there should be no delay in applying for a royal charter, although it would seem to me that such an honour should be conferred upon a body which has proved its worth, I am wholly against advocating a registrable diploma of general practice.

Dr. Cameron's concern for improving the standard of general practice is, of course, understandable, but I am sure that his traditional plan for attaining this end is the wrong one. The mind boggles at the thought of yet another diploma to be added to the surfeit of examinations for this and that which we have already. And the fact that it will shortly be impossible to practise medicine at all after the completion of one's house appointments without a "higher qualification" makes a mockery of the qualifying examination. If it be true, as Dr. Cameron asserts, that the equality of colleges partly depends upon whether they are also examining bodies, then I am sure that, when it becomes widely appreciated that to-day one's diploma count is more important than one's experience, the problem will cease to exist among the ensuing inevitable and widespread changes. (If the loss of a lively source of income is felt too deeply, then I for one will be glad to subscribe to an annual flag day.)

No, let us resist the temptation to foster this present impossible system of promotion by creating an examination for general practitioners, and instead allow the College of General Practitioners to prove its worth by influencing the revolution in medical education which is now spluttering into life. Let it ensure that the curriculum for the qualifying examination is designed to produce general practitioners, and not housemen. Let it then encourage a system of promotion based on experience instead of academic honours. In this way, perhaps the new College will be able to find its own feet by helping to recover the dignity of the established royal colleges, which is waning in face of this craze for collecting diplomas instead of beer-bottle tops. Until then, we are in no position to ridicule the reasoning of the patient who prefers his general practitioner to be an M.R.C.S., L.R.C.P., rather than a plain M.B., B.S.—"After all, has he not eight letters as against four? He must be twice as good!"—I am, etc.,

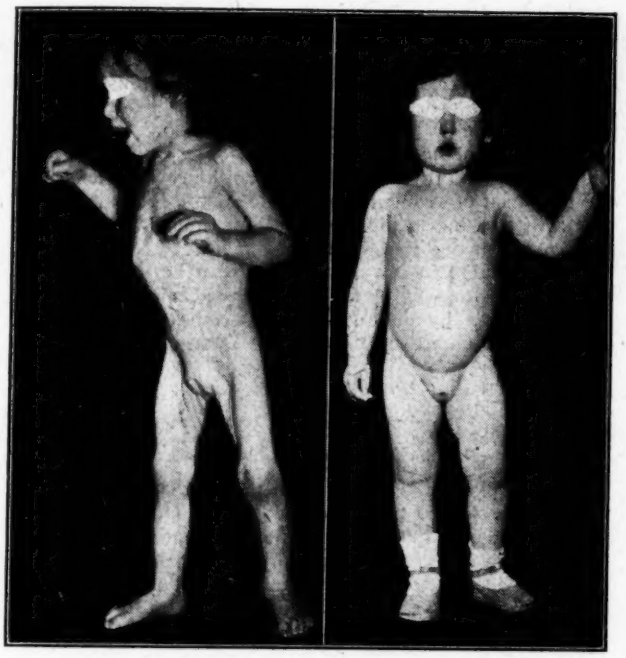
Barnstaple. G. V. BALMFORTH.

Ferrous Sulphate Poisoning

SIR,—Dr. F. G. M. Ross's article (*Journal*, November 28, 1953, p. 1200) prompts us to record a similar case of pyloric obstruction following ferrous sulphate poisoning. At the same time we wish to support the views expressed in the leading article in the same issue on "Accidental Poisoning of Children" (p. 1207). These show there are many medicines prescribed for adults which should be labelled "Poisonous for Children," and in this particular instance the manufacturers of the green sugar-coated ferrous sulphate pills should also be urged to make their preparation less like "smarties," the sugar-coated chocolate sweets beloved by all small children. Attempts along these lines made by the Paediatric Department in Oxford have been unsuccessful, and it is to be hoped that another appeal with the weight of the B.M.A. behind it may be more effective. Ferrous sulphate is extensively prescribed for mothers attending antenatal and post-natal clinics, and after the arrival of the new babe it has seemed to us that it is the toddler of 1–2 years, temporarily less well supervised, who is in danger; certainly the majority of the seven cases seen here in the last three years fall into this category.

A baby girl, aged 16 months, arrived in hospital from the country just over an hour after swallowing an unknown number of ferrous sulphate tablets, 20 of which she had vomited immediately. She was pale and restless on admission, and vomiting

blood-stained fluid; a stomach washout with sodium bicarbonate produced more fresh and altered blood, but no tablets. She continued to vomit, and at the end of 24 hours looked ill and shocked. Her haemoglobin had fallen to 55%, so she was given a small blood transfusion, followed by one of glucose saline to maintain hydration. Her condition then steadily improved and she was discharged well after 12 days, taking a light diet without vomiting, and weighing 18 lb. 10 oz. (8.38 kg.). Seen after three weeks, her appetite was said to have been poor, she had vomited occasionally, but had gained weight. Seen again four weeks later, however, she presented with symptoms of pyloric obstruction, weighing only 15 lb. 11 oz. (7.06 kg.).



Before operation. 3½ months after operation.

At operation many adhesions were found between the stomach and surrounding viscera, and in particular those between stomach and liver were so tough as to necessitate sharp dissection for their separation. The distal half of the stomach was thickened, rigid and fibrotic, the proximal half was hypertrophied and dilated, but was otherwise normal, as was the duodenum. The fibrotic portion of stomach was resected, a Billroth I type of partial gastrectomy being performed. The post-operative course was satisfactory, and a rapid gain of 4 lb. (1.8 kg.) in the first four weeks occurred. Subsequent progress during the past two years has continued to be good.

The pathologist's report on the portion of stomach removed stated: "The gastric wall almost up to the upper limit of resection was grossly fibrotic and 0.75 cm. in thickness. The mucosal surface had a granular brownish appearance, and the lumen of the whole pyloric antrum and pylorus was narrowed to about 0.1 cm. diameter. *Histology:* Over part of the specimen gastric mucosa remains, while elsewhere this is replaced by a granulation tissue layer in areas of ulceration, or by squamous epithelium which is presumably due to metaplasia. The mucosa shows slight irregularity of pattern, with scattered small cysts lined by flattened epithelium, and exaggerated mucus secretion. The squamous epithelium is regular with no invasive tendency. The submucosa and granulation tissue are congested and oedematous, with a very dense inflammatory exudate including polymorphonuclear leucocytes, plasma cells, and lymphocytes. The muscularis and subserosa are also congested, with interstitial haemorrhage, but here the most obvious change is a diffuse fibroblastic proliferation. Inflammatory infiltration similar to that in the submucosa extends down into these layers, chiefly around vessels, and iron-containing histiocytes are present in large aggregates. The mucosal cells give only a weak staining reaction for iron, and the histiocytic accumulations may be due to interstitial haemorrhage, but their extreme frequency makes this unlikely. A thin fibrinous layer covers the serosa. The appearances as a whole are in keeping with a corrosive poison, and the intra-epithelial iron is a strong indication that the poison was or included an iron compound."

It is evident that "pyloric obstruction" does not adequately describe the pathological lesion, which is in fact an extensive fibrosis affecting all coats of the distal half of the stomach and leading to a near obliteration of its lumen.

In these cases of poisoning it appears that the children swallow the tablets whole, and it is only after the sugar coating dissolves that the caustic action of the ferrous sulphate occurs. The oesophagus, therefore, escapes completely, and it follows that the maximum damage is done to the pyloric end of the stomach. This is borne out in Ross's case, where the *x*-ray several days before operation showed obstruction to barium in the distal half of the stomach. The appropriate treatment must be, therefore, to relieve the gastric obstruction by a gastro-enterostomy or gastrectomy.—We are, etc.,

A. ELLIOT-SMITH.
PAMELA A. DAVIES.

Oxford.

Tales of a Pomander

SIR,—Professor Charles Singer (*Journal*, December 19, 1953, p. 1373) is surely wrong in stating that Richard Mead made no important contribution to medical science. In 1748 Mead first described the occurrence of fatty liver in a case of diabetes mellitus, and held the view that the liver was in some way concerned in the aetiology of the disease. This was quite revolutionary in an age when medical opinion was divided between those who believed diabetes mellitus to be due to a "disordered assimilation" by the intestines and those who supported the theory of a "morbid affliction" of the kidneys, and, of course, antedated Claude Bernard's important discoveries by a hundred years. The wonder is that any man with Mead's reputation as a practising physician could have found the time to indulge in medical research.—I am, etc.,

A. PATON.

London, S.E.1.

Medical Needs in the Gold Coast

SIR,—Dr. D. B. Scott's letter (*Journal*, December 19, 1953, p. 1377) is very interesting. First, let me say that I was in the Gold Coast Medical Service until June, 1953—not years ago. Next, it is certain that the Government would eagerly offer permanent pensionable posts to specialists *if they could be found*. The response to advertisements has been uniformly poor, so, rightly or wrongly, they seem to think that if they offered contract terms a few highly qualified men could be found by a form of secondment. For instance, a consultant could go to the Gold Coast to do, say, two tours with full assurance that only strictly temporary locums would assist his group in his absence. After his contract he would then be able to return to his former job invigorated, having also given new vitality to the Colony. This scheme is clearly capable of development and diversification. In the interest of avoiding waste of professional men, could the B.M.A. not usefully press for S.H.M.O. posts for ex-colonial specialists and for similar measures?

Finally, a vague air of dissatisfaction surrounds Dr. Scott's letter, and the reason for it is not quite clear. There are at least two fellow Cambridge men in the Gold Coast Medical Service, recently employed, who show every sign of enjoying their work.—I am, etc.,

K. A. TAYLOR.

Manchester.

Distinguishing a Psychopath

SIR,—The exchange of views between eminent legal and psychiatric experts on the definition of a psychopath (*Journal*, November 28, 1953, p. 1224) serves to show how difficult it is for lawyers and alienists to attain mutual understanding. The crux of the problem appears to lie in the fact that lawyers, accustomed to dealing in tangibles, are for ever pressing the psychiatrist to confine himself to nice definitions. Although the diagnostic term "psychopathic personality" is widely recognized among psychiatrists, nobody has succeeded in defining it in a universally acceptable or succinct manner. The definition given by Dr. Denis Hill to the Royal Commission on Capital Punishment stresses

the violent propensities of the *aggressive* psychopath, but psychopaths are not necessarily aggressive or impulsive. Indeed, the inadequate psychopath may be totally lacking in these qualities. The definition of psychopaths (used by Mr. Christmas Humphreys) as "those persons who do not suffer from a disease of the mind, but suffer from some form of character deficiency or emotional instability which makes it impossible for them to enter into normal contact with society," is much broader than that attributed to Dr. Hill. However, it must be as difficult to define "normal contact with society" as to define "normal behaviour." The latter definition might perhaps be strengthened if the words "from a disease of the mind" were altered to read "from one of the well *recognized* diseases of the mind," and the words "normal contact with society" changed to "*harmonious* contact with society." Dr. A. Shepherd's definition (*Journal*, December 19, 1953, p. 1379) lacks the virtue of brevity, yet it fails to cover the cardinal features of all types of psychopath.

Criticism of the above definitions has been made to support a belief that a psychopathic personality defies *precise* definition. The term psychopathic personality has been frequently stretched to include not only personalities displaying immaturity with volcanic aggressiveness, but chronic liars, spongers, swindlers, vagrants, perverts, and addicts. Clearly, it is impossible to adopt a Procrustean attitude towards such a motley group of social misfits. Nevertheless, it would make medico-legal practice easier if lawyers and psychiatrists could agree on some broad, working "definition" of a psychopath (like that quoted by Mr. Humphreys) leaving the interpretation of such expressions as "abnormal behaviour" and "normal contact with society" to the common sense of judge, jury, and counsel.—I am, etc.,

Littlemore, Oxford. J. TODD.

SIR,—The definition by Dr. Denis Hill (*Journal*, November 28, 1953, p. 1224), as is the case of all other definitions, invites criticism. The most obvious weakness lies in the word "abnormal," which is repeated three times. Mr. Justice Hilbery did not hesitate to pounce upon this, and sought definitions of "abnormal" and "normal" behaviour—which of course were not forthcoming. I doubt whether it is possible to define these terms accurately, any more than it is possible to define insanity and sanity; and similarly I do not believe it is possible to define clearly what constitutes "psychopathic behaviour." The only definition of psychopathic personality that I like at all is the quotation given at the beginning of a paper by Drs. Curran and Mallinson[1]: "I can't define an elephant; but I know one when I see one." Unfortunately this can be readily criticized as having the flaw of a variable, personal bias.

The other observation I would make is that positive types of abnormal behaviour are referred to, but not negative types. Violent outbursts of temper can certainly be pathological, but a poverty of emotional reactivity is surely just as pathological. There are passive, relatively unemotional psychopaths who fall into criminality through such negative constitutional failings, often being the tools of aggressive psychopaths; and if we are to claim some measure of diminished responsibility for the latter we should logically also demand a similar privilege for the former.

Finally, I would point out that Dr. Hill's definition can be descriptive of some cases of cyclothymic illness, and is therefore not exclusive.—I am, etc.,

Basingstoke. I. ATKIN.

REFERENCE

1 "Recent Progress in Psychiatry," *J. ment. Sci.*, 1944, 90, 266.

Treatment of Blood Disorders with A.C.T.H. and Cortisone

SIR,—The M.R.C. Haematology Panel has again published a report to the Medical Research Council (*Journal*, December 26, 1953, p. 1400); and it is difficult to imagine how it can be of use to the practising physician, even although it may quite possibly be what the Council requires. The first report[1] made the task of the haematological physician much more difficult than it need have been, because competent general practitioners, who had read that "A.C.T.H. and cortisone, as at present used, are not likely to have an important part to play in the treatment of disorders of the blood" were not keen on co-operating with those of us who, aware of the work of Dameshek,[2] wanted to treat cases of acquired haemolytic jaundice with these hormones. The second report is not likely to be quite such a nuisance, but it will certainly not be a help. Thus there is the veiled suggestion that if A.C.T.H. in adequate dosage fails, as it did in two of the Panel's cases, cortisone will be equally useless. And this suggestion seems to be based on failure in the only case in which cortisone was given—in inadequate amounts. My own (inevitably small) experience has clearly shown that there are cases in which A.C.T.H. fails to arrest the haemolytic process, whereas cortisone will do so. And I am not alone in this experience: Aitchison[3] has demonstrated the fact quite clearly.

This letter is not intended to record my experiences in the treatment of acquired haemolytic jaundice with A.C.T.H. and cortisone, but to pose the question whether such reports as the present one should not remain in the archives of the M.R.C., because in my opinion they can be no use to the practitioners for whom they are intended, and can, indeed, do great harm by discouraging physicians who have little experience in clinical haematology.—I am, etc.,

London, W.1. A. PINEY.

REFERENCES

1 *British Medical Journal*, 1952, 1, 1261.
2 *Blood*, 1950, 5, 779.
3 *British Medical Journal*, 1953, 1, 78.

SIR,—The second report to the M.R.C. (*Journal*, December 26, 1953, p. 1400) records a more favourable impression of the value of A.C.T.H. and cortisone in the treatment of acquired haemolytic anaemia and thrombocytopenic purpura. In deciding to concentrate in future on the long-term treatment of these two conditions the advisory panel of haematologists may discourage the use of cortisone in the non-thrombocytopenic purpuras, notably Schönlein–Henoch disease. The value of any treatment is difficult to assess where spontaneous remission is the rule rather than the exception, and not unnaturally opinions differ.

Professor L. S. P. Davidson *et al.* (*Journal*, November 15, 1952, p. 1059) recorded no beneficial results from hormonal treatment of four cases of non-thrombocytopenic purpura (allergic). Dr. M. G. Philpott refers (*Journal*, October 24, 1953, p. 937) to nine children who did not respond although severe constitutional disturbances might have been alleviated as in one of Davidson's cases. Dr. M. Stephanini (*Lancet*, September 19, 1953, p. 620) in a similar series of nine children believed that A.C.T.H. was of great value even if it might not modify the pathogenetic mechanism of the disease. Unlike Philpott he thought that the improvement in cases which did respond was "too prompt to be exclusively due to spontaneous recovery." Dr. D. G. Adamson *et al.* (*Journal*, September 19, 1953, p. 656) obtained an apparently conclusive response in a girl of 13 years. From personal experience I know that cortisone promptly controlled the abdominal features of Schönlein–Henoch purpura which had increased in severity for three weeks during which time all other treatment had been tried by my most skilled and attentive colleagues. The associated joint pains also responded, but the purpuric spots persisted for long after the cessation of cortisone treatment (28 days).

So long as the existence of purpura and positive capillary tests applied to the skin are regarded as the criteria of non-success then such cases must be recorded as failures of hormonal therapy despite the dramatic and possibly life-saving effect of cortisone or A.C.T.H. on the visceral lesions in certain cases. Purpura of the skin may be produced by minimal disturbances and accentuated by mechanical considerations. It may be illogical to associate its pathogenesis directly with that of the viscera despite the

fact that the only abnormality in the classical Schönlein–Henoch syndrome is diminished capillary resistance. It is likewise generally accepted that the syndrome is an allergic phenomenon despite the fact that the allergen is rarely, if ever, found and no response is elicited by antihistamine drugs.

So little is known of its pathogenesis, or for that matter of the action of cortisone or A.C.T.H., that one cannot say with any certainty that hormone treatment is either useless or specific. At the same time there would appear to be enough justification to administer cortisone or A.C.T.H. in full doses to every case of Schönlein–Henoch purpura, bearing in mind that spontaneous remission, in this admittedly rare disease, is not the foregone conclusion that some present-day clinicians might have us believe.—I am, etc.,

Kirkcaldy. J. R. W. HAY.

A Cosmetic Amputation

SIR,—What Sir Heneage Ogilvie said in his letter (*Journal*, December 12, 1953, p. 1322) appealed to me so much that I wrote and told him so. I am consequently bound to express a little surprise that Mr. Ian Lawson Dick (*Journal*, January 2, p. 45) differs so markedly. It may be that in time his views will change.

Some years ago I also was impressed and attracted by this "cosmetic" operation—"nobody notices that there are only three fingers," "the 'knob' does not catch on openings of pockets or bags," and so on. But with the passage of time I have come to the conclusion that on balance the cosmetic gain does not by any means justify the functional loss. With the head of the metacarpal many manual assets including the "hollow of the hand" disappeared, but, what is more important, the control of which the hand is capable is seriously impaired. I say that the operation should never be performed on manual workers, and that even for other patients it should be used only after the most careful consideration and explanation. I am, in fact, inclined now to advise such patients for whom the metacarpal amputation appears to be justified by diminution of disfigurement and of convenience to wait and see how much inconvenience the metacarpal knob really causes before they have it removed. "Two bites at a cherry"—I know, and quite right too.—I am, etc.,

Liverpool, 1. BRYAN MCFARLAND.

Whither Anaesthesia?

SIR,—In Dr. C. Langton Hewer's letter (*Journal*, January 2, p. 42) he poses the question "Whither Anaesthesia?" and criticizes the new approach to anaesthetic problems. It is, of course, impossible to hazard a guess as to where physiological and pharmacological research may lead us in the near future. It appears to us that if we are to fulfil our duty to our patients we must take advantage of every means by which they may be protected from the effects of surgical aggression.

Anaesthetic techniques in general use to-day, however skilfully employed, and with the aid of supportive measures, have well recognized limitations. In fact the term "anaesthetic shock" is still in current use. The precise physiological mechanism by which surgical shock is induced is not completely understood; but the factors which lead to the onset of shock in surgical procedures are well known. These have been admirably classified by Dr. Langton Hewer himself.[1] By the use of the artificial hibernation technique, reaction to all but one of these causes is removed or diminished. As we have already stated (*Journal*, December 5, 1953, p. 1247), the circulating blood volume must be maintained. In the beginning we employed this technique only in those cases where operation could not otherwise have been contemplated. Our experience of what must necessarily be a small series of this type was so encouraging that we felt that an exchange of views with other workers in this field would be an advantage. We hope soon to publish a much larger series of results.

In answer to Dr. Hewer's charges that the technique is complicated and uses a multiplicity of drugs, we would point out that it is extremely simple, and, in fact, fewer drugs are used than in many methods in current use. We have in the past used these drugs, pethidine, promethazine, and chlorpromazine, as adjuvants to normal anaesthesia. We found this line of research impractical, as the results were equivocal and any improvement could not be definitely attributed to the drug under investigation. It is also suggested that paralytic ileus and pulmonary complications are more frequent. This is certainly not so where hibernation alone is employed. Physical cooling introduces additional hazards and has not been employed by us.

Dr. Langton Hewer is concerned about the term "artificial hibernation." We have taken pains to point out that it is not a truly comparable state to that found in the hibernant mammal, but is a term we have used to avoid confusion with methods employing active physical cooling. We await another Oliver Wendell Holmes to improve on it.—We are, etc.,

ANGUS SMITH.
J. G. FAIRER.

London, N.W.1.

REFERENCE

[1] *Recent Advances in Anaesthesia and Analgesia*, 1953, 7th ed. Churchill, London.

Management of Ulcerative Colitis

SIR,—May we comment upon the annotation on the management of ulcerative colitis (*Journal*, December 19, 1953, p. 1364) and challenge the traditional view that patients with this disease are primarily "inadequate and dependent sufferers"—a belief that leads many to regard it as a disorder of psychogenic origin? Wittkower did, indeed, find that in many patients psychological abnormalities were present before the colitis began; but he also found the same in patients suffering from pulmonary tuberculosis.[1]

We would again raise the *post hoc propter hoc* argument and submit that the personality features of those with ulcerative colitis, such as lack of aggressiveness, timidity, reliance on others, undue resentment of the disease, and "immaturity," are the result of months or years of diarrhoea—the most humiliating and incapacitating of symptoms. No one has, or is ever likely, to study the personalities of the patients before the complaint begins. Now, however, many have been restored to a normal active life by surgery and an efficient ileostomy bag; the observation of these is far more important that any psychiatric assessments made during the course of the illness. This group of patients that have been "cured" seem to us to be a remarkably normal cross-section of the community. There are 70 cases who regularly attend this centre for follow-up review; all except three have by now returned to a full-time job. The women have had no difficulty in adjusting themselves to family life, socially and from the sexual aspect; the complete range from labourer to teaching and high executive posts with heavy responsibilities is represented by jobs now undertaken by our male patients. As individuals they appear to be as capable of enjoying life as their more fortunate fellows who have not been afflicted with this disease. Many have been seen regularly over five years or more and are strikingly free from neurotic traits or induced symptoms. They have not been submitted to psychiatric assessment; yet it may be that our personal and intimate knowledge of them over a period of time is as valuable as an interview with a psychiatrist.

Psychological factors are important in every case of diarrhoea, whether this be due to ulcerative colitis, steatorrhoea, or Crohn's disease, for the influence of the mind on the alimentary tract is great. We ourselves believe that any of these diseases will produce the same type of personality if the diarrhoea is sufficiently prolonged, but that this will disappear when it is relieved.—We are, etc.,

B. N. BROOKE.
C. F. HAWKINS.

Birmingham.

REFERENCE

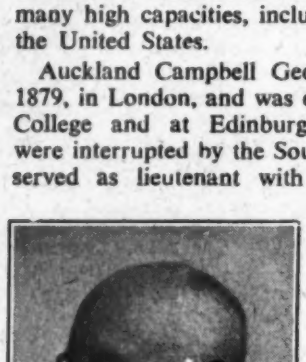
[1] *Lancet*, 1949, 2, 805.

Obituary

LORD GEDDES, P.C., G.C.M.G., K.C.B., M.D.

The career of Lord Geddes, who died in hospital at Chichester on January 8, furnishes another instance of a man who turned from medicine to serve the State in many high capacities, including that of Ambassador to the United States.

Auckland Campbell Geddes was born on June 21, 1879, in London, and was educated at George Watson's College and at Edinburgh University. His studies were interrupted by the South African war, in which he served as lieutenant with the third Highland Light Infantry. Returning to Edinburgh for his medical studies—he was one of Sir William Turner's pupils—he graduated M.B., Ch.B., with honours, in 1903. He took a prominent part in university life and played in the first Rugby football fifteen. After postgraduate study on the Continent he won the gold medal for his M.D. thesis in 1908. His first appointment was that of demonstrator and assistant professor of anatomy at Edinburgh, and later he became professor of anatomy of the Royal College of Surgeons in Ireland. In 1910 he was secretary of the Section of Anatomy at the B.M.A. Annual Meeting, and in 1912 vice-president of the same Section.



[Elliott & Fry, Ltd., London

His next appointment was to the chair of anatomy at McGill University, Montreal, but when war broke out in 1914 he obtained extended leave and recrossed the Atlantic, serving first with the Northumberland Fusiliers on the east coast of England and in 1915 and 1916 in France, where he was promoted brevet lieutenant-colonel for gallant and distinguished conduct in the field. He served for a time with great success as Deputy Assistant Adjutant General and came to the notice of the war leaders. The Prime Minister at that time, Mr. Lloyd George, had a great opinion of the abilities of Auckland Geddes and of his brother Eric, and Auckland was made Director of Recruiting at the War Office in 1916. In the following year he became Minister of National Service at a time when Britain was being fitted into the unfamiliar and uneasy battle-dress of conscription. He entered Parliament for Basingstoke and Andover in 1917, and his first task was to introduce a Military Service Bill.

In 1918 Sir Auckland Geddes, as he had now become, was made President of the Local Government Board, while retaining his position as Minister of National Service. The days of the Local Government Board were numbered, for the Ministry of Health was in the offing. This *Journal*, in acclaiming the appointment of a medical man to this position, said that no doubt the state of the physical fitness of the nation, which had been brought home to the Minister of National Service as a result of the recruiting figures, would influence the advice he gave to his Cabinet colleagues on the establishment of the Ministry of Health. Geddes, however, was not destined to be the first Minister of Health; that post, by a coincidence, was for another anatomist, Dr. Christopher (later Lord) Addison. Geddes continued as Minister of National Service, a Ministry which, with the end of the war, had left the active for the passive stage, and to this was added the Ministry of Reconstruction, which really meant that he shouldered a principal responsibility for demobilization. Later in 1919 for a brief period he followed Lord Ashfield as President of the Board of Trade.

In 1919 an invitation came to him to return to McGill, this time as Principal, his duties to begin in the autumn of that year. He had no sooner accepted the appointment than he had to resign it, for early in 1920 he was appointed British Ambassador in Washington. In spite of some expectation to the contrary he did well in this post and added to his already great reputation. Unfortunately serious eye trouble forced him to resign in 1924. Later he forsook both the academic world and the world of politics and diplomacy and became immersed in big business, being chairman of the Rio Tinto Company and interested in other corporations.

Early in 1939 the imminence of war again brought him into public prominence. He was appointed regional commissioner for the south-eastern district of England, with headquarters at Tunbridge Wells, to direct civil defence. He resigned this post in September, 1941, for he had to undergo an operation for cataract, resulting from a burn of the right eye (he had lost the sight of his left eye while serving in Washington). His recovery was a good one, and in December, 1941, he was made regional commissioner for the north-western region, but owing to impairment of his general health he was compelled to resign this appointment also. For the last few years of his life he had been totally blind.

In the New Year's honours in 1942 he was raised to the peerage as Baron Geddes of Rolvenden, where he had a country house in Kent. He had been created K.C.B. in 1917 and G.C.M.G. in 1922. Lord Geddes married in 1906 Isabella Gamble, the daughter of W. A. Ross, of New York, and had four sons and one daughter.

CYRIL LEWIS, M.D.

Dr. Cyril Lewis, one of the oldest and most respected physicians in South Wales, died peacefully at his home at Cardiff on December 30, 1953, in his 85th year. His death severs a link with bygone medicine. His father, a doctor, born in the year of Waterloo, was apprenticed to a Dr. Watkins, and was educated at University College Hospital, London, where he was gold medallist in surgery. He qualified in 1838 and later took the M.D. and the M.R.C.P. After holding resident appointments at University College Hospital for two years, he returned to his native Carmarthen, where he practised for many years and was physician to the Carmarthenshire Infirmary. He was a justice of the peace and lived to the age of 87.

Born in 1869, Cyril Lewis was educated at Carmarthen Grammar School, at Bedford School, and at Edinburgh University, where he graduated M.B., C.M. in 1891. He proceeded to the M.D. six years later, receiving a commendation for his thesis. After graduation he acted as assistant medical officer to the Mental

Hospital at Carmarthen for three months, and in 1892 became resident medical officer at the Royal National Hospital for Diseases of the Chest, Ventnor, "at a salary of £100 a year," which after 18 months was increased to £120 and later to £150. After six and a half years at Ventnor he went to the Metropolitan Hospital, London, as senior house-physician "at a salary at the rate of £40 a year with board, washing, and lodging." In 1899 he became house-physician to Birmingham General Hospital, and was there for two years. In 1902 he settled in practice at Cardiff, being elected honorary anaesthetist to Cardiff Royal Infirmary later in the same year. Early in 1906 he was appointed honorary assistant physician to the Royal Infirmary, and in 1913 was promoted to the senior staff as honorary physician, which post he held until he reached the age of retirement in 1934. Throughout the 1914–18 war he served as a major on the staff of the Third Western General Hospital, and in the last war he gave his services to the Military Hospital at Whitchurch and the Prince of Wales Hospital, Cardiff.

A knowledgeable physician who enjoyed the practice of medicine, Dr. Lewis visited his wards almost daily and would never fail to call to see every emergency admitted to them. Always willing and eager to try new remedies, he never forgot that his patients were human beings with individual personalities and physiques, and he took both into account when considering diagnosis and treatment. For many years he gave the lectures in medicine to the nurses at the Royal Infirmary, and on the establishment of the Welsh National School of Medicine in 1931 he became a recognized clinical teacher. He took a keen personal interest in his students and in the welfare of his old house-physicians, and was not averse to dropping hints to them on "suitable young ladies." He himself married a trained nurse and held the firm view that nurses made the best of wives.

As a man Dr. Lewis was completely unselfish, self-effacing to a degree, full of sympathetic understanding, kindness, and never-failing courtesy. He treated all alike, from the junior probationer to the senior surgeon. He was a good amateur carpenter and mechanic, and at his home had a fitted workshop where he loved to pass his spare time making all sorts of things. Failing health obliged him to give up active work in 1946, and, although confined to the house for the 12 months preceding his death, he was alert mentally to the end and ever interested in all that was going on. Out of the fullness of years his reminiscences of men and affairs were always most informing:

> "His head was silvered o'er with age,
> And long experience made him sage."

In his younger days Dr. Lewis was extremely versatile. While at Edinburgh he served in the volunteer medical staff corps and attained the rank of staff sergeant. He was a great cyclist, and is known to have cycled on a "penny-farthing" machine from Edinburgh to his home in Carmarthen for his holidays. He was a good tennis player and had played in amateur tournaments. Having a knowledge of music and a good voice, he was active in organizing and taking part in entertainments for patients when he was a resident medical officer. At Ventnor, in particular, he did much to help in the amusement of the patients. He took part in concerts and amateur theatricals not only at the hospital but also at the local assembly rooms, and, being an excellent performer, often gave solos on the flute. When he left Ventnor a most successful farewell concert was arranged in his honour, and a clock and an illuminated address were presented to him. On leaving the hospital the patients and staff lined the drive and cheered him on his way. Thus in his young days, as in his old, he was sincerely loved by all. A member of the British Medical Association for 61 years, he was one of the two honorary secretaries of the Cardiff Division from 1907 to 1912, and in 1928, when the Association held its Annual Meeting at Cardiff, he served as a vice-president of the Section of Medicine. The funeral service was held at St. Andrew's Church, Cardiff, where he had been a churchwarden for 35 years. He is survived by his widow and two sons, one of whom is a member of the medical profession in practice at Hove.—A.M.K.

Dr. JAMES WARNOCK, who died at Oxford on December 4, 1953, at the age of 74, was for 40 years a well-known general practitioner in Leeds. As a student he had a distinguished career at Queen's College, Galway, and at Belfast. He took the B.A. of the Royal University of Ireland in 1901, gaining first place and first-class honours, and when he proceeded to the M.A. two years later he obtained first-class honours in mathematics and was awarded a special prize. He then entered the faculty of medicine and graduated M.B., B.Ch., B.A.O. in 1906, gaining first-class honours. He rounded off his scholastic record by winning a gold medal when he proceeded to the M.D. in 1908. In the following year he settled in general practice at Leeds, where he remained until he retired to live at Abingdon, Berkshire, in 1949. He served with distinction in the first world war, being mentioned in dispatches, and in 1919 he was appointed O.B.E. On returning to civilian life he built up an extensive family practice, while as certifying factory surgeon he took a special interest in industrial medicine long before it became a vogue. A shrewd and sound clinician, he was a family doctor of the old school, enjoying to the full the confidence and affection of his patients, notwithstanding his absolute frankness, for he had no time for any humbug or window dressing. Of a somewhat shy and diffident nature, he took little part in public affairs, although he was prevailed upon to serve on the executive of the Leeds Division of the B.M.A. for a time and was chairman of the Division in 1934–5. Dr. Warnock was a man of considerable culture and erudition. The study of higher mathematics remained an engaging passion to the end of his life; it was not uncommon to find him after his afternoon surgery deeply engrossed in some problem of the calculus. His other hobbies showed the same love of refined detail and scrupulous exactitude, although in a more practical form. He made furniture of a very high order of craftsmanship, while his inlaid trays and mirrors were especially attractive. In his latter years he took up bookbinding with the same enthusiasm and attention to detail. All these additional accomplishments made him an arresting personality and a rather unique type of family doctor. His passing is a great loss to his many friends and medical colleagues. Dr. Warnock is survived by his wife, a married daughter, and a son, Mr. G. J. Warnock, who is a Fellow and tutor of philosophy of Magdalen College, Oxford.—W. MACA.

Dr. HANS SCHAEFER, a well-known general practitioner at Enfield, Middlesex, died in a London nursing-home on December 14, 1953, after a short illness. He was born on February 15, 1888, and was educated in Berlin. After qualifying, he worked as a surgeon in several hospitals there, and in 1923 became assistant in Professor Borchardt's surgical department. Later Dr. Schaefer established his own general practice, while still retaining his keen interest in orthopaedic and plastic surgery. In 1934 he

came to England, and after re-qualifying in Scotland in 1936 he settled again in general practice in the Enfield area, where he soon acquired an excellent reputation among his patients, to whom he became not only a medical adviser but a good friend. His chief interest outside his professional life was sculpture, and he was himself an artist of exceptional ability. To all his friends he was a man of eternal youth and of unfailing charm and kindness; in spite of his brilliant attributes he remained always humble. Our deep sympathy is extended to his widow.—E. G.

The death occurred on December 27, 1953, of Dr. JAMES GILCHRIST in a nursing-home at Sydenham, where he had been in general practice for nearly half a century. He was 76 years of age. James Gilchrist was born in Aberdeenshire on July 4, 1877, and from the local grammar school he entered Aberdeen University in 1894, graduating M.A. in 1898, and taking the degrees of M.B., Ch.B. three years later. After five years spent chiefly in private practice he proceeded to the M.D. in 1906, and then settled in general practice in Sydenham. From 1918 to 1930 he was honorary surgeon to the South-eastern Hospital for Children at Sydenham, and for many years was medical officer to the Passmore Edwards Teachers' Home, district medical officer to the Post Office, and medical referee to assurance companies. A member of the British Medical Association for 40 years, he was chairman of the Lewisham Division in 1923–4, and represented the division at the Annual Representative Meeting held at Glasgow in 1922. From 1928 to 1950 he was treasurer of the Sydenham District Medical Society, which he joined in 1909, and proved himself a prudent adviser. He had also been president of the society. His great sense of humour was very much appreciated by his fellow members, to whom he would relate anecdotes in a way that was all his own. "Gilly," as he was known to his many friends, was a pattern of the old kind of family doctor; a good physician and surgeon, he devoted his life to the relief of suffering in others, and was well loved by his patients. He is survived by his widow, who was a most devoted helpmeet in his practice, and two sons, both members of the medical profession, the elder being a wing commander in the Royal Air Force and the younger a member of the Colonial Medical Service.—F. M. B.

Dr. BERNARD RIVIERE died at his home at Salhouse, near Norwich, on December 27, 1953, at the age of 73. He retired from general and surgical practice in Norwich nearly thirty years ago, and this enabled him to give more time to ornithology, on which he was a well-known authority. Bernard Beryl Riviere was born in London on April 13, 1880, the son of Briton Riviere, a Royal Academician, from whom he inherited some of his artistic talent. Educated at St. Paul's School, London, and at St. Andrews University, he received his clinical training at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1904. Two years later he obtained the diploma of F.R.C.S. After qualification he held the appointments of house-surgeon at Bart's, clinical assistant at the East London Hospital for Children, and house-physician at Birmingham General Hospital. Then, in 1908, he joined a partnership in Norwich, where he also became honorary surgeon to the Jenny Lind Hospital. In 1914, for health reasons, he was obliged to leave Norwich, and for the next two years lived in Switzerland and South Africa. On his return to England he resumed his medical work at Norwich until the mid-twenties, when increasing anxiety about his health forced him to retire. Eventually he made a good recovery, and in 1929 he was appointed to the board of the Norwich Union Insurance Societies. He took an increasingly important part in the business and for a short time during the last war he was vice-president of the Norwich Union Life Society. He was also a trustee of the East Anglian Trustee Savings Bank. Always a keen naturalist, Dr. Riviere had been a member of the Norfolk and Norwich Naturalist Society for 45 years, serving a term as president, and he was also treasurer of the Norfolk Naturalists' Trust. In 1930 he published *A History of the Birds of Norfolk*, the best work on the subject there is. He was also the author of many pleasantly written articles on the habits of individual birds. In 1927 he was co-opted a member of the Norwich Museums Committee, his knowledge of natural history and art proving of great value in the work of the committee. As an artist he had a number of small works of sculpture to his credit, and he was a member of the Norfolk and Norwich Art Circle. He is survived by a widow, formerly Miss Veronica Mack, and three sons.

Dr. MONTAGUE WAY, a member of a well-known Portsmouth family, died at his home at Southsea on December 30, 1953, at the age of 78. Montague Harold Way was a medical student at Guy's Hospital, where he held the post of house-surgeon after qualifying in 1897. After a short period of service in India as a plague medical officer he returned to England and went into practice in Portsmouth, where he had been senior house-surgeon at the Royal Portsmouth Hospital. In addition to devoting himself to his steadily growing practice, Dr. Way took a great interest in public affairs and was a member of the Portsmouth City Council for eight years. He was also a past chairman of the Portsmouth Conservative and Unionist Association. In 1926 he was appointed a justice of the peace. For 13 years he was a member of the old Portsmouth Insurance Committee and its chairman in 1930–1; he was also a member of the local panel committee and for a number of years attended the annual Panel Conference. During the first world war he served as a captain in the R.A.M.C. at the 5th Southern General Hospital and in Salonika. A member of the British Medical Association for 56 years, he was chairman of the Portsmouth Division in 1924–5. He retired from practice as long ago as 1932. Seven years later he was appointed O.B.E. in recognition of his political and public services.

M. A. K. writes: The death of Dr. Montague Way has removed from the ranks of general practitioners in Portsmouth a notable member. His father was a well-known Portsmouth solicitor, and his uncle was equally well known as a doctor in Portsmouth before him so that he inherited a name already well respected and appreciated in the city. Municipal and magisterial honours followed in due course and were combined with much activity in politics, horticulture, and other interests. He was a frequent attender at B.M.A. meetings almost to the end of his life. But it is in the hearts of his patients that a family doctor's memory may be enshrined, and this can be said of Dr. Montague Way. He leaves two sons, Dr. John Way, of Horndean, and Mr. Paul Way, of London, by his first wife. He afterwards married Miss Scott Foster, a daughter of Sir Scott Foster, a previous Lord Mayor of Portsmouth. To his widow and sons we offer our deep sympathy.

The sudden death of Miss B. E. NESBITT, the well-known ear, nose, and throat surgeon, in Edinburgh on December 30, 1953, at the age of 55, leaves a gap that will be hard to fill. Born at Galway on July 7, 1898, Belinda Elizabeth Nesbitt was educated at the Methodist College and at Queen's University, Belfast, where she graduated M.B., B.Ch. in 1924. She then held house-surgeon posts at the Royal Ear Hospital (now the ear, nose, and throat department of University College Hospital, London), the King Edward VII Hospital, Windsor, and the Birmingham and Midland Ear and Throat Hospital. After further extensive postgraduate study in London and Vienna she became a Fellow of the Royal College of Surgeons of Edinburgh in 1931 and immediately set up in consultant practice. Later she became ear, nose, and throat surgeon to the Bruntsfield Hospital and the Eye, Ear, and Throat Infirmary, Edinburgh, the Redlands Hospital for Women, and the Dunfermline and West Fife Hospital. Always a hard worker, she built up a wide and

busy practice and took infinite pains with all her patients. Her bright and happy disposition never failed to bring comfort to all who came under her care. Miss Nesbitt was a skilled pianist, but her chief recreation was golf, a game she took up after the war, and to it she devoted the same keenness and enthusiasm which characterized her work. She won the trophy of the City of Edinburgh Branch of the British Medical Association on two occasions and the Notts Ladies' Challenge Cup at the Annual Meetings of the B.M.A. in 1949 and 1950. Her husband, Mr. C. R. Duncan Leeds, won the Treasurer's Cup in the latter year, and this was possibly a unique event in the history of these competitions. To Mr. Duncan Leeds, who is an ophthalmic surgeon in Edinburgh, we offer our sincere sympathy in his loss.

Medico-Legal

DIABETIC MOTORIST ACQUITTED

Salford's stipendiary magistrate, Mr. Leslie Walsh, gave his reserved judgment on January 8 in the case of Robert Geoffrey Healey, 28, of Heywood, Lancs, who had pleaded not guilty to driving his car under the influence of a drug and dangerous driving.

The alleged offences occurred, said the Stipendiary, when Healey's car was involved in an accident in Bury New Road, Salford, on November 7, 1953. Police said that Healey's car ran backwards into a bus and then shot forward and collided with a van. The magistrate said that Healey suffered from diabetes and was treated with insulin. On the day of the accident he attended a diabetic clinic in Manchester and was seen by a doctor. He left the clinic and was later involved in the accident in circumstances which prima facie showed dangerous driving. Medical evidence was given, which was not contradicted, that his condition—hypoglycaemia—could occur without the defendant knowing about it.

"It is clear from the medical evidence," he continued, "that hypoglycaemia could arise without premonitory symptoms, and I am satisfied that Healey had no warning of the attack. In these circumstances the issue on dangerous driving is covered by a High Court ruling on motorists suddenly attacked by an illness which incapacitates them. I find that he was not guilty of dangerous driving. As for the charge of driving under the influence of a drug, I think that this section of the Act was never intended to cover such cases. The condition of hypoglycaemia could be caused in a diabetic by other factors than insulin, such as extra exertion, worry, or exasperation. As I am satisfied that Healey took only his normal dose of insulin on the day in question, and had never previously suffered ill effects as the result of that dose, I am not satisfied that he was under the influence of insulin at the time of this accident. Before the accident he was seen by a doctor, when his condition was normal. The charge will therefore be dismissed."

Universities and Colleges

UNIVERSITY OF OXFORD

The Theodore Williams Scholarship in Pathology for 1953 has been awarded to Antony Babington Herring.

UNIVERSITY OF CAMBRIDGE

Dr. W. E. Hick has been appointed Reader in Experimental Psychology from October 1, 1953.

The following degrees were conferred on November 28, 1953:
M.D.—M. G. Thorne, J. K. Wagstaff.
Sc.D.—Kenneth Bailey, Ph.D., F.R.S.

The Raymond Horton-Smith Prize for 1952–3 has been awarded to Dr. John Perrin and Dr. Ernest Keith Westlake (equal).

UNIVERSITY OF LONDON

The degrees of M.B., B.S. were awarded to D. D. J. Rees on October 21, 1953, the date to be inscribed on the diploma to be June 25, 1952.

The following candidates at the Institute of Psychiatry have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—G. F. Vaughan, Lorna Wheelan. *Part I:* R. H. Gosling, W. A. Kennedy, J. Pisani, N. H. Rathod.

UNIVERSITY OF MANCHESTER

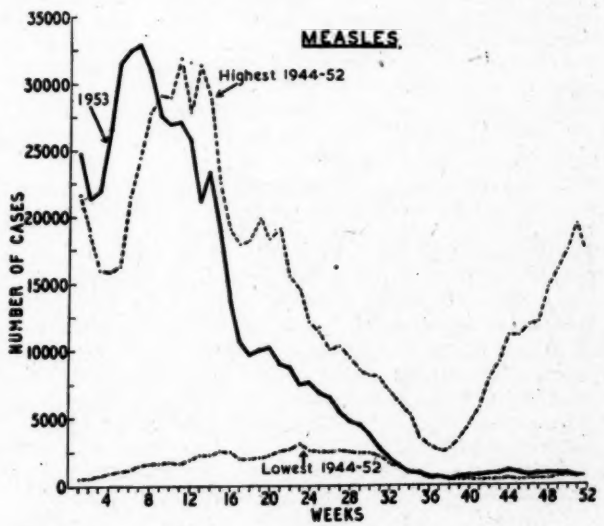
The following candidates have been approved at the examination indicated:

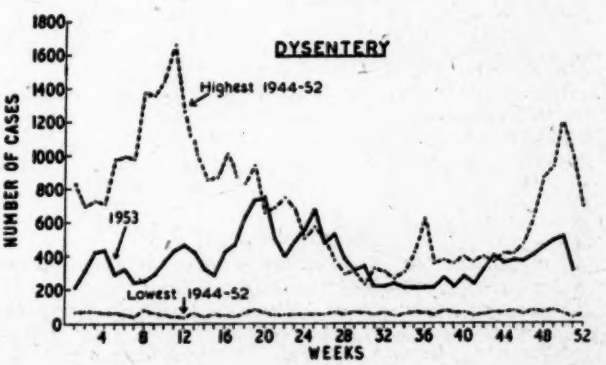
FINAL M.B., CH.B.—Sheila Berry, J. K. Bleasdale, C. Booth, Margaret A. Broughton, J. W. Chamberlain, G. H. H. Dwyer, Pauline R. Dyckhoff, G. Gold, L. Goldie, A. Greenbaum, Mabel L. Haigh, Daphne J. Hall, F. Heyworth, J. Johnson, J. B. Jones, L. K. Levens, J. S. Lord, F. G. Lucas, Jean McCracken, C. Mawdsley, V. B. Maxwell, F. W. Murphy, W. C. Newport, J. Parkin, L. Reece, Eve M. Roper, J. G. B. Russell, Ruth M. Sellars, Joan E. Singleton, J. N. Standring, A. O. F. Stuart, A. T. Thompson, S. T. Whitehead.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus - - - - - - -, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





came to England, and after re-qualifying in Scotland in 1936 he settled again in general practice in the Enfield area, where he soon acquired an excellent reputation among his patients, to whom he became not only a medical adviser but a good friend. His chief interest outside his professional life was sculpture, and he was himself an artist of exceptional ability. To all his friends he was a man of eternal youth and of unfailing charm and kindness; in spite of his brilliant attributes he remained always humble. Our deep sympathy is extended to his widow.—E. G.

The death occurred on December 27, 1953, of Dr. JAMES GILCHRIST in a nursing-home at Sydenham, where he had been in general practice for nearly half a century. He was 76 years of age. James Gilchrist was born in Aberdeenshire on July 4, 1877, and from the local grammar school he entered Aberdeen University in 1894, graduating M.A. in 1898, and taking the degrees of M.B., Ch.B. three years later. After five years spent chiefly in private practice he proceeded to the M.D. in 1906, and then settled in general practice in Sydenham. From 1918 to 1930 he was honorary surgeon to the South-eastern Hospital for Children at Sydenham, and for many years was medical officer to the Passmore Edwards Teachers' Home, district medical officer to the Post Office, and medical referee to assurance companies. A member of the British Medical Association for 40 years, he was chairman of the Lewisham Division in 1923–4, and represented the division at the Annual Representative Meeting held at Glasgow in 1922. From 1928 to 1950 he was treasurer of the Sydenham District Medical Society, which he joined in 1909, and proved himself a prudent adviser. He had also been president of the society. His great sense of humour was very much appreciated by his fellow members, to whom he would relate anecdotes in a way that was all his own. "Gilly," as he was known to his many friends, was a pattern of the old kind of family doctor; a good physician and surgeon, he devoted his life to the relief of suffering in others, and was well loved by his patients. He is survived by his widow, who was a most devoted helpmeet in his practice, and two sons, both members of the medical profession, the elder being a wing commander in the Royal Air Force and the younger a member of the Colonial Medical Service.—F. M. B.

Dr. BERNARD RIVIERE died at his home at Salhouse, near Norwich, on December 27, 1953, at the age of 73. He retired from general and surgical practice in Norwich nearly thirty years ago, and this enabled him to give more time to ornithology, on which he was a well-known authority. Bernard Beryl Riviere was born in London on April 13, 1880, the son of Briton Riviere, a Royal Academician, from whom he inherited some of his artistic talent. Educated at St. Paul's School, London, and at St. Andrews University, he received his clinical training at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1904. Two years later he obtained the diploma of F.R.C.S. After qualification he held the appointments of house-surgeon at Bart's, clinical assistant at the East London Hospital for Children, and house-physician at Birmingham General Hospital. Then, in 1908, he joined a partnership in Norwich, where he also became honorary surgeon to the Jenny Lind Hospital. In 1914, for health reasons, he was obliged to leave Norwich, and for the next two years lived in Switzerland and South Africa. On his return to England he resumed his medical work at Norwich until the mid-twenties, when increasing anxiety about his health forced him to retire. Eventually he made a good recovery, and in 1929 he was appointed to the board of the Norwich Union Insurance Societies. He took an increasingly important part in the business and for a short time during the last war he was vice-president of the Norwich Union Life Society. He was also a trustee of the East Anglian Trustee Savings Bank. Always a keen naturalist, Dr. Riviere had been a member of the Norfolk and Norwich Naturalist Society for 45 years, serving a term as president, and he was also treasurer of the Norfolk Naturalists' Trust. In 1930 he published *A History of the Birds of Norfolk*, the best work on the subject there is. He was also the author of many pleasantly written articles on the habits of individual birds. In 1927 he was co-opted a member of the Norwich Museums Committee, his knowledge of natural history and art proving of great value in the work of the committee. As an artist he had a number of small works of sculpture to his credit, and he was a member of the Norfolk and Norwich Art Circle. He is survived by a widow, formerly Miss Veronica Mack, and three sons.

Dr. MONTAGUE WAY, a member of a well-known Portsmouth family, died at his home at Southsea on December 30, 1953, at the age of 78. Montague Harold Way was a medical student at Guy's Hospital, where he held the post of house-surgeon after qualifying in 1897. After a short period of service in India as a plague medical officer he returned to England and went into practice in Portsmouth, where he had been senior house-surgeon at the Royal Portsmouth Hospital. In addition to devoting himself to his steadily growing practice, Dr. Way took a great interest in public affairs and was a member of the Portsmouth City Council for eight years. He was also a past chairman of the Portsmouth Conservative and Unionist Association. In 1926 he was appointed a justice of the peace. For 13 years he was a member of the old Portsmouth Insurance Committee and its chairman in 1930–1; he was also a member of the local panel committee and for a number of years attended the annual Panel Conference. During the first world war he served as a captain in the R.A.M.C. at the 5th Southern General Hospital and in Salonika. A member of the British Medical Association for 56 years, he was chairman of the Portsmouth Division in 1924–5. He retired from practice as long ago as 1932. Seven years later he was appointed O.B.E. in recognition of his political and public services.

M. A. K. writes: The death of Dr. Montague Way has removed from the ranks of general practitioners in Portsmouth a notable member. His father was a well-known Portsmouth solicitor, and his uncle was equally well known as a doctor in Portsmouth before him so that he inherited a name already well respected and appreciated in the city. Municipal and magisterial honours followed in due course and were combined with much activity in politics, horticulture, and other interests. He was a frequent attender at B.M.A. meetings almost to the end of his life. But it is in the hearts of his patients that a family doctor's memory may be enshrined, and this can be said of Dr. Montague Way. He leaves two sons, Dr. John Way, of Horndean, and Mr. Paul Way, of London, by his first wife. He afterwards married Miss Scott Foster, a daughter of Sir Scott Foster, a previous Lord Mayor of Portsmouth. To his widow and sons we offer our deep sympathy.

The sudden death of Miss B. E. NESBITT, the well-known ear, nose, and throat surgeon, in Edinburgh on December 30, 1953, at the age of 55, leaves a gap that will be hard to fill. Born at Galway on July 7, 1898, Belinda Elizabeth Nesbitt was educated at the Methodist College and at Queen's University, Belfast, where she graduated M.B., B.Ch. in 1924. She then held house-surgeon posts at the Royal Ear Hospital (now the ear, nose, and throat department of University College Hospital, London), the King Edward VII Hospital, Windsor, and the Birmingham and Midland Ear and Throat Hospital. After further extensive postgraduate study in London and Vienna she became a Fellow of the Royal College of Surgeons of Edinburgh in 1931 and immediately set up in consultant practice. Later she became ear, nose, and throat surgeon to the Bruntsfield Hospital and the Eye, Ear, and Throat Infirmary, Edinburgh, the Redlands Hospital for Women, and the Dunfermline and West Fife Hospital. Always a hard worker, she built up a wide and

busy practice and took infinite pains with all her patients. Her bright and happy disposition never failed to bring comfort to all who came under her care. Miss Nesbitt was a skilled pianist, but her chief recreation was golf, a game she took up after the war, and to it she devoted the same keenness and enthusiasm which characterized her work. She won the trophy of the City of Edinburgh Branch of the British Medical Association on two occasions and the Notts Ladies' Challenge Cup at the Annual Meetings of the B.M.A. in 1949 and 1950. Her husband, Mr. C. R. Duncan Leeds, won the Treasurer's Cup in the latter year, and this was possibly a unique event in the history of these competitions. To Mr. Duncan Leeds, who is an ophthalmic surgeon in Edinburgh, we offer our sincere sympathy in his loss.

Medico-Legal

DIABETIC MOTORIST ACQUITTED

Salford's stipendiary magistrate, Mr. Leslie Walsh, gave his reserved judgment on January 8 in the case of Robert Geoffrey Healey, 28, of Heywood, Lancs, who had pleaded not guilty to driving his car under the influence of a drug and dangerous driving.

The alleged offences occurred, said the Stipendiary, when Healey's car was involved in an accident in Bury New Road, Salford, on November 7, 1953. Police said that Healey's car ran backwards into a bus and then shot forward and collided with a van. The magistrate said that Healey suffered from diabetes and was treated with insulin. On the day of the accident he attended a diabetic clinic in Manchester and was seen by a doctor. He left the clinic and was later involved in the accident in circumstances which prima facie showed dangerous driving. Medical evidence was given, which was not contradicted, that his condition—hypoglycaemia—could occur without the defendant knowing about it.

"It is clear from the medical evidence," he continued, "that hypoglycaemia could arise without premonitory symptoms, and I am satisfied that Healey had no warning of the attack. In these circumstances the issue on dangerous driving is covered by a High Court ruling on motorists suddenly attacked by an illness which incapacitates them. I find that he was not guilty of dangerous driving. As for the charge of driving under the influence of a drug, I think that this section of the Act was never intended to cover such cases. The condition of hypoglycaemia could be caused in a diabetic by other factors than insulin, such as extra exertion, worry, or exasperation. As I am satisfied that Healey took only his normal dose of insulin on the day in question, and had never previously suffered ill effects as the result of that dose, I am not satisfied that he was under the influence of insulin at the time of this accident. Before the accident he was seen by a doctor, when his condition was normal. The charge will therefore be dismissed."

Universities and Colleges

UNIVERSITY OF OXFORD

The Theodore Williams Scholarship in Pathology for 1953 has been awarded to Antony Babington Herring.

UNIVERSITY OF CAMBRIDGE

Dr. W. E. Hick has been appointed Reader in Experimental Psychology from October 1, 1953.

The following degrees were conferred on November 28, 1953:
M.D.—M. G. Thorne, J. K. Wagstaff.
Sc.D.—Kenneth Bailey, Ph.D., F.R.S.

The Raymond Horton-Smith Prize for 1952–3 has been awarded to Dr. John Perrin and Dr. Ernest Keith Westlake (equal).

UNIVERSITY OF LONDON

The degrees of M.B., B.S. were awarded to D. D. J. Rees on October 21, 1953, the date to be inscribed on the diploma to be June 25, 1952.

The following candidates at the Institute of Psychiatry have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—G. F. Vaughan, Lorna Wheelan. *Part I:* R. H. Gosling, W. A. Kennedy, J. Pisani, N. H. Rathod.

UNIVERSITY OF MANCHESTER

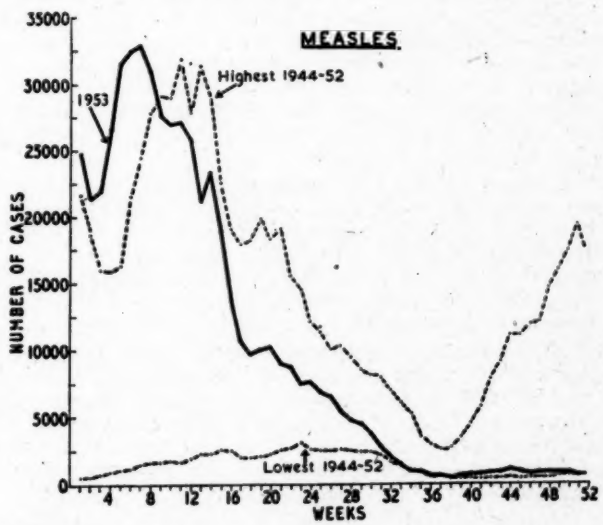
The following candidates have been approved at the examination indicated:

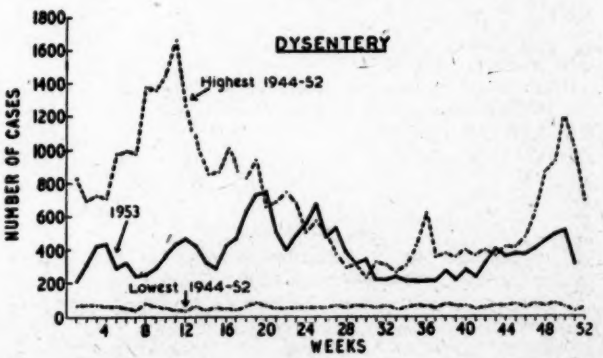
FINAL M.B., CH.B.—Sheila Berry, J. K. Bleasdale, C. Booth, Margaret A. Broughton, J. W. Chamberlain, G. H. H. Dwyer, Pauline R. Dyckhoff, G. Gold, L. Goldie, A. Greenbaum, Mabel L. Haigh, Daphne J. Hall, F. Heyworth, J. Johnson, J. B. Jones, L. K. Levens, J. S. Lord, F. G. Lucas, Jean McCracken, C. Mawdsley, V. B. Maxwell, F. W. Murphy, W. C. Newport, J. Parkin, L. Reece, Eve M. Roper, J. G. B. Russell, Ruth M. Sellars, Joan E. Singleton, J. N. Standring, A. O. F. Stuart, A. T. Thompson, S. T. Whitehead.

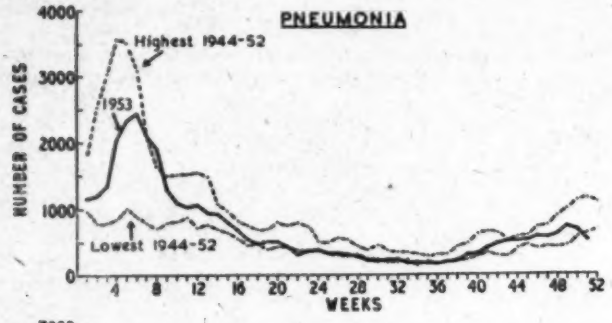
Vital Statistics

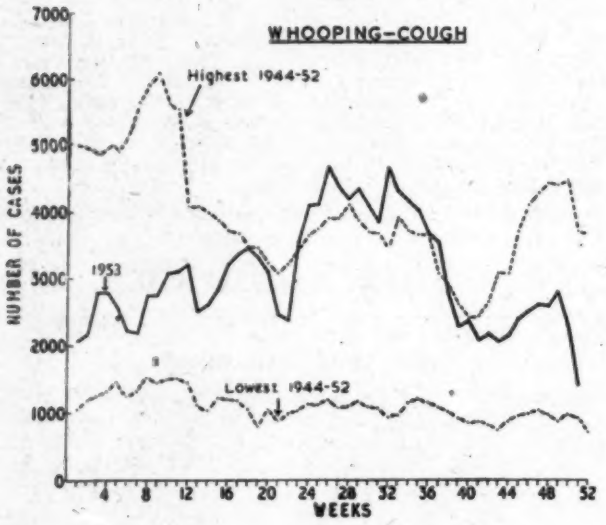
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus - - - - - - -, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

The usual fall in the number of notifications of infectious diseases that occurs during Christmas week was reported in England and Wales during the week ending December 26. The decreases in the number of notifications included 880 for whooping-cough, from 2,304 to 1,424; 335 for scarlet fever, from 1,284 to 949; 194 for dysentery, from 503 to 309; 167 for measles, from 778 to 611; and 162 for acute pneumonia, from 692 to 530.

The largest falls in the notifications of whooping-cough were 80 in Lancashire, from 220 to 140; 59 in Derbyshire, from 85 to 26; 56 in Southampton County, from 110 to 54; 47 in Kent, from 109 to 62; 46 in Essex, from 115 to 69; 45 in London, from 101 to 56; 44 in Glamorganshire, from 83 to 39; 44 in Yorkshire West Riding, from 177 to 133; 40 in Durham, from 69 to 29; 39 in Hertfordshire, from 61 to 22; and 36 in Middlesex, from 79 to 43. The largest fall in the local returns of scarlet fever was 37 in Essex, from 83 to 46. 15 cases of diphtheria were notified, being 1 fewer than in the preceding week. The chief features of the returns of diphtheria were a fall from 5 to 0 in Durham and a rise from 1 to 5 in Lancashire. The only large decline in measles was 43 in Lancashire, from 177 to 134.

29 cases of acute poliomyelitis were notified during the week. These were 20 fewer for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were London 4, Kent 3, and Lancashire 3.

The largest returns for dysentery were London 52 (Islington 19), Yorkshire West Riding 39 (Sowerby Bridge U.D. 15, Bradford C.B. 9), Lancashire 35 (Bolton C.B. 12), Leicestershire 23 (Leicester C.B. 20), Middlesex 21 (Enfield U.D. 11), Norfolk 21 (Norwich C.B. 20), and Kent 20 (Cranbrook R.D. 13).

Week Ending January 2

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,111, whooping-cough 2,284, diphtheria 29, measles 1,327, dysentery 340, acute poliomyelitis 53, paratyphoid fever 0, and typhoid fever 1.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **December 26** (No. 51) and corresponding week 1952.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953 Eng & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	15	0	7	0		23	3	6	0	
Dysentery	309	52	107	0	8	327	34	77	4	4
Encephalitis, acute	3	1	0	0		7	0	0	0	
Enteric fever:										
Typhoid	0	0	1	0		5	0	0	0	
Paratyphoid	1	0	0	0		1	0	1 (B)	0	
Food-poisoning	109	11		2		58	8		0	
Infective enteritis or diarrhoea under 2 years				10	10				6	14
Measles*	611	1	16	9	60	19,551	1797	181	23	40
Meningococcal infection	21	3	15	0		38	0	16	2	1
Ophthalmia neonatorum	30	2	2	0		29	2	5	0	
Pneumonia†	530	26	257	13	3	1,141	99	413	5	4
Poliomyelitis, acute:										
Paralytic	19	3	7	2	1	35	3	3	2	2
Non-paralytic	10	1				12	3			
Puerperal fever§	171	24	6	0		160	29	12	2	
Scarlet fever	949	50	212	26	28	1,881	110	320	48	60
Tuberculosis:										
Respiratory			109	17				147	15	
Non-respiratory			15	5				19	3	
Whooping-cough	1,424	56	252	39	52	1,748	90	102	57	65

DEATHS in Great Towns	1953 Eng & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	0	0	0	0	0	1	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	12	1	2	1	1	18	4	3	0	0
Influenza	12	0	2	0	0	45	9	3	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		2	2				3	0		
Pneumonia	219	29	31	9	3	515	125		16	9
Poliomyelitis, acute	1	0			0	6	3			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	80	9	27	2	1	160	37	14	5	4
Non-respiratory		1	2	0	0		2	3	0	1
Whooping-cough	3	1	0	0	0	1	0	2	0	0
Deaths 0–1 year	188	22	47	7	3	256	34	42	9	12
Deaths (excluding stillbirths)	4,541	637	641	88	104	7,679	1523	746	143	125
LIVE BIRTHS	4,575	659	666	184	206	6,764	1045	769	197	277
STILLBIRTHS	153	12	14			168	13	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Pharmaceutical Research.—The cost of research in the British pharmaceutical industry is now between £2,000,000 and £2,500,000 a year, according to Mr. S. M. Lennox, president of the Chemists' Federation. He was speaking at a dinner given by the National Pharmaceutical Union to the Chemists' Federation and the Council of the Pharmaceutical Society on January 6. He added that the industry now employed over 50,000 people and produced pharmaceutical products to the value of over £90,000,000 a year.

Scottish Hospital Endowments Research Trust.—The Secretary of State, Mr. James Stuart, has now appointed the trustees. The chairman is Sir John Erskine, formerly general manager of the Commercial Bank of Scotland, and the members are Lieutenant-Colonel Donald Cameron of Lochiel, Mr. J. T. Dowling, Mr. R. L. Gwilt, Dr. James Lawson, Bailie James A. Mackie, and Mr. Iain Maxwell Stewart. The Trust's general funds, which will provide an income of up to £120,000 a year, will be built up from a proportion of the endowments of the former voluntary hospitals in Scotland, and also from gifts and legacies from private individuals. The Trust is charged with the duty of assisting medical research in Scotland, and will be advised by the Advisory Committee on Medical Research in Scotland, of which Sir Edward Appleton is chairman.

Diploma in Health Education.—The University of London Institute of Education has arranged a year's full-time course in health education (fee £62 10s.) leading to a diploma. It is intended for those wishing to train for work in this field and is open to lecturers in training colleges and departments of education, qualified teachers, doctors, nurses, health visitors, sanitary inspectors, and others. The London School of Hygiene and Tropical Medicine and the Central Council for Health Education have agreed to give some help with the course, which will comprise lectures, seminars and discussions, and field work. The syllabus includes the following subjects: principles of education; principles of social and preventive medicine; history and administration of public health and education; scientific bases of health and human behaviour; and principles, methods, and media of health education. Behind this new move by London University is the recognition that the best use of the nation's health services demands an instructed public. Improvements in the public health depend largely on the individual layman taking the trouble to observe the elementary rules of hygiene. Further details about the course may be obtained from the secretary, University of London Institute of Education, Malet Street, London, W.C.1.

Deaf Children.—One of the most urgent problems for the parent of a deaf child is what to do about his child's education. To help with this, the National Institute for the Deaf has published a booklet, "The Education of Deaf Children," prepared with the help of the National College of Teachers of the Deaf, which answers many of the questions such a parent would want to ask. The booklet contains a number of articles on teaching deaf children by leading British authorities and a full list of the schools for the deaf and partially deaf in the British Isles. The booklet costs 1s. 3d., and may be obtained from the National Institute for the Deaf, 105, Gower Street, London, W.C.1.

The Cost of Private Treatment.—The London Association for Hospital Services, controlled by a council of management whose members are nominated by the B.M.A., the Royal Colleges, and the King Edward's Hospital Fund for London, offers a comprehensive insurance scheme to those who wish to provide in this way for the costs of private medical treatment. Lately the London Association has been able to improve its benefits and conditions. One scheme is intended specially for doctors. It covers the expenses of private in-patient treatment at any hospital or recognized nursing-home, including monetary gifts to professional colleagues. The latter are sent direct by the London Association as a present from the doctor who has received treatment. Full details of this and other schemes may be obtained from the London Association for Hospital Services, Tavistock House South, Tavistock Square, London, W.C.1.

Dispensing Opticians.—The Board of Registration of Medical Auxiliaries has issued a "Register of Dispensing Opticians." It contains the names of 352 dispensing opticians whose applications for registration were received and approved by the Board up to the end of last November. The names are classified geographically and alphabetically. In each case place of employment, private address, telephone number, and qualification are given. If an artificial eye service or contact lens service is provided this is also indicated. Copies of the Register may be obtained, free, on application to the Secretary and Registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

Sir Ewen Maclean's Will.—After various substantial legacies, which included £1,000 each to the Welsh National School of Medicine (to augment the Ewen Maclean Research Scholarship) and the Cardiff Royal Infirmary and £500 to the B.M.A. Charities Fund, Sir Ewen Maclean left one-third of his residuary estate to the Welsh National School of Medicine and another third to the Royal College of Obstetricians and Gynaecologists, of which he was president from 1935 to 1938. Sir Ewen Maclean was president of the B.M.A. in 1928 when the annual meeting was held in Cardiff, and previously he had been chairman of the Representative Body.

President of British Association.—At a ceremony at Burlington House on January 8 Dr. E. D. Adrian, O.M., president of the Royal Society, was inducted as the 116th president of the British Association by the retiring president, Sir Edward Appleton.

Editorship of "Brain."—Sir Russell Brain, P.R.C.P., has assumed the editorship of *Brain* in place of Sir Francis Walshe.

Sir Andrew Davidson, Chief Medical Officer of the Department of Health for Scotland, is to retire on March 31. He was appointed in 1941.

Lord Horder.—In honour of his 83rd birthday Lord Horder's former house-physicians entertained him to dinner on January 7 at the Royal Society of Medicine. Dr. A. C. Roxburgh was in the chair.

Mr. R. Scott Stevenson, who has left London to live in Gibraltar, was presented with a gift in recognition of his services as chairman of the National Institute for the Deaf from 1945 to 1954 at a dinner held on January 7 with Lord St. Audries in the chair.

Professor W. O. Reinhardt, of the department of anatomy, University of California, is coming to Bristol for a year next September to work with Professor J. M. Yoffey on the reaction of the bone marrow to anoxia. Professor Reinhardt has been given a grant by the United States Public Health Service for this purpose.

COMING EVENTS

Oxford Graduates' Medical Club.—The winter dinner will be held at the Royal College of Surgeons, Lincoln's Inn Fields, on Friday, January 29, at 7 for 7.30 p.m. Sir Russell Brain will be in the chair. Tickets (price 38s.) may be obtained from Mr. Selwyn Taylor, 3, Roedean Crescent, London, S.W.15.

Contraceptive Technique.—A lecture and demonstration will be given by Marie Stopes, Ph.D., at the Mothers' Clinic,

108, Whitfield Street, London, W.1, on Thursday, February 4, at 2.30 p.m. Admission free, but tickets must be obtained in advance.

Fifth International Congress on Mental Health.—The congress will be held in Toronto from August 14 to 21, and the theme will be "Mental Health in Public Affairs." Further information may be obtained from 111, St. George Street, The Congress Office, Toronto, Canada.

NEW ISSUES

Annals of the Rheumatic Diseases.—The next issue (Vol. 12, No. 4, December, 1953) will be available in a week's time. The contents include:

ARTHROMYODYSPLASIA CONGENITA. Philip Ellman and F. Parkes Weber.
PULMONARY LESIONS OF DISSEMINATED LUPUS ERYTHEMATOSUS. S. I. Rapaport, L. Meister, F. M. Steele, and S. R. Caniglia.
PRODUCTION OF ARTHRITIS IN THYROPARATHYROIDECTOMIZED RAT BY INJECTIONS OF DEOXYCORTONE ACETATE. R. G. Harrison and T. J. Barnett.
FINGER CONTRACTURES DUE TO TENDON LESIONS AS A MODE OF PRESENTATION OF RHEUMATOID ARTHRITIS. B. M. Ansell and E. G. L. Bywaters.
RESTORATION OF KNEE JOINT FUNCTION IN CHRONIC RHEUMATOID ARTHRITIS. Robert L. Preston.
EFFECT OF ACTH AND SODIUM SALICYLATE ON THE URINARY URIC ACID: CREATININE RATIO, AND CIRCULATORY EOSINOPHILS IN MAN. F. G. W. Marson.
COLLAGEN DISEASE COMPLICATING MALIGNANCY. John Lansbury.
RHEUMATIC DISEASES IN DENMARK. K. Kalbak.
EPIDEMIOLOGY OF RHEUMATIC FEVER IN A RURAL DISTRICT IN ITALY. A. Poppi, G. Labo, G. Lenzi, and L. Rosa.
INCIDENCE OF REFLEX SYMPATHETIC DYSTROPHY OF THE UPPER EXTREMITY. Veikko A. I. Laine.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d. Available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, January 18

HUNTERIAN SOCIETY.—At the Mansion House, 8.30 p.m., Hunterian Lecture by Dr. George Crile (Cleveland, Ohio): Under Southern Seas.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Care and Treatment of the Squinting Child.

Tuesday, January 19

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor G. R. Cameron, F.R.S.: Tissue Repair.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. N. Goldsmith: Vegetating Dermatoses.
LONDON UNIVERSITY.—At Meverstein Theatre, Westminster Medical School, 5.30 p.m., special university lecture in medicine by Dr. George Crile (Cleveland, Ohio): Medical Treatment of Hyperthyroidism and Thyroiditis.
ROYAL EYE HOSPITAL.—5.30 p.m., Dr. B. S. Cardell: Pathology of the Ocular Melanomas.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Professor W. I. C. Morris: Complete Perineal Tear.
SOCIETY FOR THE STUDY OF ADDICTION.—At 11, Chandos Street, Cavendish Square, W., 8 p.m., Dr. J. H. Gould: Biochemical Detoxication in the Treatmem of Alcoholism; Lady Frankau: Vitamins Plus Subconvulsive Therapy in the Treatment of Long-standing Alcoholism.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, Wandsworth Common, 8.30 p.m., Dr. W. D. W. Brooks: Aetiology and Treatment of Bronchitis (illustrated by lantern slides).

Wednesday, January 20

EUGENICS SOCIETY.—At Burlington House, Piccadilly, W., 5.30 p.m., Dr. J. Spencer, Ph.D.: Delinquent Behaviour: Some Unanswered Questions.
HARVEIAN SOCIETY OF LONDON.—8.15 p.m., Presidential Address by Dr. Tom Hare: The Tudor Ancestors of Dr. William Harvey.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Clefts, Vesicles, and Bullae
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. R. Ogier Ward: Stone in the Ureter.
●LONDON UNIVERSITY: DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.—At Beveridge Hall, Senate House, 7 p.m., Sir John D. Cockcroft, F.R.S.: Atomic Research at Harwell.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Edgware General Hospital, 3 p.m., clinical meeting. Dr. G. S. C. Sowry: The Inheritance of Essential Hypertension; coloured film by Dr. G. Riddell Royston: A Case of Scurvy.
MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., joint meeting with Junior Legal Club, Birmingham Law Society.
PHYSIOTHERAPISTS ASSOCIATION, LTD.—At Bonnington Hotel, Southampton Row, W.C., 7 p.m., Mr. R. Rowden Foote: Varicose Veins (with coloured film).
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Moynihan Lecture by Dr. George Crile (Cleveland, Ohio): Treatment of Diseases of the Thyroid Gland.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Operations and Their Indications (4).
SOCIETY FOR ANALYTICAL CHEMISTRY.—At Institution of Electrical Engineers, 6 p.m., joint meeting with Royal Institute of Chemistry. Subject: Determination of Alcohol in Blood and Urine. Paper by Dr. D. W. Kent-Jones, Ph.D., F.R.I.C., and Mr. G. Taylor, F.R.I.C.
SOCIETY OF PUBLIC ANALYSTS.—At Institution of Electrical Engineers, 6 p.m., joint meeting with Royal Institute of Chemistry. Subject: Determination of Alcohol in Blood and Urine. Paper by Dr. D. W. Kent-Jones, Ph.D., F.R.I.C., and Mr. G. Taylor, F.R.I.C.

Thursday, January 21

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. D. D. Reid: Design of Clinical Experiments.
EDINBURGH CLINICAL CLUB.—At 7, Drumsheugh Gardens, 8 p.m., Dr. E. H. Cameron: Ophthalmology in General Practice.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Honorary Presidential Address by Professor R. A. Lennie.
●INSTITUTE OF CHILD HEALTH.—5.30 p.m., Miss B. C. Marshall: Handling of the Family in Mental Deficiency.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., demonstration of cases of pathological interest
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., films: (1) Early Diagnosis of Acute Anterior Poliomyelitis; (2) Industrial Dermatitis; (3) Venomous Snakes—Medical Aspects.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor Arnold Sorsby: Abiotrophy.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Lieutenant-Colonel A. K. Brown, R.A.M.C., and Dr. A. Knudsen: Acute Haemorrhagic Fever—Clinical and Pathological Aspects. A discussion will follow.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. Macdonald Critchley: Parietal Symptomatology.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. M. Partridge.

Friday, January 22

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. W. N. Goldsmith: Vegetating Dermatoses.
LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., pathological meeting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor Henry Barcroft, F.R.S.: Sympathetic Control of Human Blood Vessels.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Professor J. W. Crofton: Tuberculosis: Scotland's Problem.
ROYAL SANITARY INSTITUTE.—At Town Hall, Slough, 10 a.m., Symposium on Industrial Health. Miss E. Schofield: Factory Law and Health; Dr. A. A. Eagger: Slough Industrial Health Service and Area Services; Dr. M. E. M. Herford: The Appointed Factory Doctor—Possible Developments; Dr. E. Hughes: The View of a Medical Officer of Health.

Saturday, January 23

BRITISH ASSOCIATION OF ALLERGISTS.—At Royal Society of Medicine, 11 a.m., Professor G. Payling Wright: Fate of Injected Soluble Antigens; 11.40 a.m., Dr. J. H. Humphrey: Participation of Formed Elements of the Blood in Experimental Allergic Reactions; 2.30 p.m., Dr. J. G. Cunningham: The Actions to Ethylenediamine Tartrate in Industry; 3 p.m., Dr. H. Wyres: Some Unusual Industrial Sensitivities; 3.30 p.m., Dr. P. B. S. Fowler: Printers' Asthma.

APPOINTMENTS

CURRAN, A. P., M.B., Ch.B., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer, County Borough of West Ham.
GRAY, DAVID KEMPSON, M.B., B.S., Resident Aural Registrar, The Hospital for Sick Children, Great Ormond Street, London, W.C.
LIVERPOOL REGIONAL HOSPITAL BOARD.—R. D. Hotston, M.B., Ch.B., M.R.C.P., Part-time Consultant Physician to Hospitals in North Wirral Area; P. M. O'Flanagan, L.R.C.P.&S.I., D.P.M., Whole-time Consultant Psychiatrist to Winwick Hospital; A. H. Bruce, F.R.F.P.S., M.M.S.A., D.A., Part-time Consultant Anaesthetist to Central Wirral and Chester Areas.
STARK, VIDA J. McF., M.D., D.P.H., Senior Medical Officer (Maternity and Child Welfare), Liverpool Public Health Department.
YOUNG, WILLIAM C., M.B., Ch.B., D.P.H., D.P.A., Medical Officer of Health, Burgh of Motherwell and Wishaw.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crane.—On January 3, 1954, to Dr. Nest Crane (formerly Llewhelin), wife of Dr. J. E. Crane, Carmarthen, a son—David Llewhelin.
Fox.—On October 14, 1952, to Rosemary (formerly Wilson), M.B., B.S., D.P.H., wife of Percy Francis Fox, of Melsetter, Southern Rhodesia, twin daughters—Annabelle and Phillippa, and on December 27, 1953, a son—Timothy.
Smith.—On December 31, 1953, at Leeds, Yorks, to Kathleen (formerly Turner), M.B., B.S., wife of Irvine Smith, F.R.C.S., a daughter—Dorothy Battinson.

DEATHS

Butler.—On December 16, 1953, at 2, Whybourne Crescent, Tunbridge Wells, Kent, George Guy Butler, M.B.E., M.D.
Dargan.—On December 14, 1953, at his home, Inglenook, Upper Clarendon Road, St. Helier, Jersey, Patrick Arthur Dargan, M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired, aged 69.
Dew.—On December 15, 1953, at Cotlands, Wimblehurst Road, Horsham, Sussex, John Wescott Dew, M.C., M.B., B.Ch., aged 66.
Fothergill.—On December 17, 1953, at 65, Bromley Road, Beckenham, Kent, Arthur Fothergill, M.D.
Heller.—On December 6, 1953, at 1, Ivywell Road, Bristol, Joseph Heller, M.D., aged 79.
Higgins.—On December 11, 1953, at his home, Nazareth Cottage, Monkstown, Co. Cork, Eire, John Higgins, M.R.C.S., L.R.C.P., Colonel, late R.A.M.C., retired.
Jones.—On December 11, 1953, at Willesborough Hospital, Ashford, Kent, Murray Parry Jones, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired, of Wye, Kent, aged 81.
Kelly.—On December 20, 1953, at Harmans Cross, Swanage, Dorset, Harry Beatty Kelly, D.S.O., M.B., B.Ch., Colonel, late R.A.M.C., retired.
Stephen.—On December 12, 1953, Karin Stephen, M.R.C.S., L.R.C.P., of 1, Upper Harley Street, London, N.W., aged 64.
Welch.—On December 12, 1953, at Dalesford, Hartley, Longfield, Kent, Frederick Day Welch, M.R.C.S., L.R.C.P., aged 75.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Hot Syringes and Vaccines

Q.—*To what extent are vaccines damaged by being aspirated into a hot syringe? Does the vaccine cool the syringe sufficiently quickly for loss of inoculating material to be unimportant?*

A.—Although some bacterial vaccines might not be damaged appreciably by brief contact with a hot syringe, the undue haste in inoculation technique implied by the question is undesirable. Moreover, a technique begun with apparent safety for a certain bacterial vaccine might lead to disaster if used for a relatively unstable product like yellow fever vaccine or for a therapeutic serum which is readily coagulable by heat. It is unnecessary to discuss the high specific heat of water or to define a "hot syringe," but a practical working rule might be that, if a syringe has cooled sufficiently to enable it to be held comfortably in the hand, it is not too hot for use.

Penicillin Lozenges

Q.—*What is the place of the penicillin lozenge in therapy?*

A.—Penicillin lozenges are not intended to provide an adequate concentration in the blood: they are used solely for their local effect.

The originators of this method of treatment, McGregor and Long, used a pastille with a gelatin base. In this, with its fairly high water content, penicillin was unstable, and when such a product came to be manufactured stability was ensured by giving it in the form of a dry tablet with a lactose base. This is the product which has caused soreness of the mouth, owing at least in part to the merely mechanical action of granules of the excipient. There may be other factors: prolonged use leads to overgrowth of a penicillin-resistant flora, and it is possible that the lactose itself affords a pabulum for bacterial growth. The position has changed again with the commercial production of stable gelatin pastilles and chewing gums; these are to be preferred to tablets.

Treatment of this kind is of little use unless continuous: a pastille should remain in the buccal sulcus until dissolved and then be replaced by another, this being continued throughout the day. It is indicated for Vincent's gingivitis and for mild haemolytic streptococcal throat infections. Whether other forms of sore throat will respond depends on their aetiology and the sensitivity to penicillin of the causative organism. Indiscriminate use will inevitably lead to many disappointments. The treatment is naturally less effective than penicillin given by injection, and whether this should replace local treatment or perhaps be given in addition to it is a matter for individual judgment.

Central Heating and Colds

Q.—*An intelligent headmaster tells me that he always postpones the central heating in his school as long as possible, regardless of the discomfort to himself, the teaching staff, and the boys, because he finds that a really troublesome epidemic of colds always follows the first use of central heating. Is this propter hoc or merely post hoc?*

A.—The only answer that could be supported by enough facts to satisfy the intellectual integrity of the headmaster is, "We do not know." Nevertheless, it has been claimed by some, e.g., van Loghem,[1] that periods of cold weather are commonly followed by a high incidence of colds, and this may support the questioner's *post hoc* interpretation. I know of no adequate study in which the effect of the use of central heating, or of its commencement in the autumn, has been related to the incidence of colds.

REFERENCE

[1] *J. Hyg. (Camb.)*, 1928, **28**, 33.

Tetanus and Sport

Q.—*In games played on grass, such as football, hockey, lacrosse, etc., in which there is a risk of open wounds, is there any evidence of a raised incidence of tetanus amongst the players? Where the playing fields are used for grazing cows and horses, or if manure is spread over the ground, is there any evidence that there is an even greater risk of tetanus? Is it advisable to inoculate schoolchildren and adults who play games under these circumstances?*

A.—While nothing is known of the existence of any series of figures showing a greater incidence of tetanus in those who play games on grass, it is relevant that the tetanus bacillus is more numerous in places where horses and cows have been grazed or where their manure has been thrown. Thus the risk of contracting tetanus would appear to be greater in playing fields where such manuring is done, or in back gardens, than in the streets of modern cities where there are relatively few horses. The largest number of cases of tetanus in peacetime occurs between the ages of 5 and 14 years, when children are very active and presumably more prone to slight septic wounds and whitlows. As might be expected, males develop tetanus much more often than females.

Since tetanus antitoxin cannot be administered prophylactically after every injury or scratch, active prophylaxis with tetanus toxoid is being used increasingly, particularly in the United States. Schoolchildren and adults, playing games on grass, could certainly be protected. Moreover, the use of a diphtheria-pertussis-tetanus prophylactic is worth considering for infant immunization.

Inheritance of Eye Colour

Q.—*How is the colour of the eyes inherited? What are the chances that two brown-eyed parents will have a child with blue eyes, and vice versa?*

A.—It used to be thought that brown versus blue eyes depended on a single gene difference, brown eyes being dominant. If this were true, brown-eyed parents could have children with brown or with blue eyes, whereas two blue-eyed parents could have only blue-eyed children. It is now known, however, that this view is oversimplified, though it may be accepted, perhaps, as a rough approximation. Probably all that can be said at present is that it would be very unusual for two blue-eyed parents to have a brown-eyed child. Some studies have, however, shown instances of this, but it is difficult at present to express an opinion as to how many may be real, how many due to faulty observation, and how many to the difficulties of classifying eye-colour.

Sunlight and Neoplastic Changes

Q.—*Is there any evidence that undue exposure to sunlight predisposes to neoplastic changes?*

A.—Reference to any standard textbook will give much information on the effects commonly resulting from undue exposure to sunlight, including neoplastic changes. They are seen more particularly in the white-skinned races, on exposed parts, in the elderly, outdoor workers, sailors, and in those who live in hot climates. Such changes are very commonly seen in Australia. There is great individual variation which to some extent goes with the degree of pigmentation, the fair and red-haired being more susceptible. In cattle, epithelioma may arise only on white patches of hide.

There is a rare congenital condition, xeroderma pigmentosum, where the susceptibility is so extreme that minimal exposure produces grave effects, and before puberty the patient may have developed numerous epitheliomata.

There is no convincing evidence that artificial sunlight therapy as ordinarily employed provokes such changes, even

when used intensively over the course of some years as was usual in the treatment of lupus vulgaris until recent years.

Growth and its Control

Q.—*What is the driving force which causes growth?*

A.—The term "driving force" is not clearly defined. Growth can be regarded as the result of the increase in size of cells and in some instances an increase in their total number. The deposition of structural material in the cell, and the processes which lead to cellular fission, are influenced by enzyme systems which in turn are influenced by genes present in the cell nucleus. The congenital absence of nuclear factors may lead to improper growth of the tissue concerned. In the more complex organisms the endocrine glands also influence growth. Hormones which affect growth include the growth hormone of the anterior pituitary gland, thyroxine or triiodothyronine from the thyroid gland, androgens from the sex glands and adrenal cortex, and adrenal-cortical hormones from the adrenal cortex. In general the adrenal-cortical hormones appear to antagonize the growth-stimulating action of pituitary growth hormone, although where adrenal insufficiency exists the administration of small doses of suitable adrenal steroids may stimulate growth. Pituitary growth hormone, as its name implies, is of particular importance in the stimulation of growth, though its mechanism of action is not known, and many physiological actions other than that of stimulating growth are ascribed to growth hormone. One view that has been put forward is that growth hormone facilitates the entry of amino-acids into the cells in order to provide for growth, but there is no certain evidence on this point. There is some evidence that insulin may exert an action similar to that of growth hormone under some conditions. Hormones which stimulate growth usually stimulate the appetite also, and the food intake and the search for food must obviously be important factors in the driving force which causes growth. But how the hormones stimulate the appetite, why the hormones which stimulate growth do not continue to do so indefinitely throughout life in higher animals, and why an organ, in the absence of a derangement of growth such as that caused by cancer, is controlled with respect to growth in relation to other organs of the body, are still matters for investigation.

Vitamin K and Dental Haemorrhage

Q.—*In what conditions is vitamin K indicated as a prophylactic against dental haemorrhages? What preparation is advised, when should it be given, and in what dosage?*

A.—Vitamin K is only indicated when the prothrombin activity has been diminished by liver damage, obstructive jaundice, malabsorption (in some cases), anticoagulant therapy with coumarin derivatives, and long-continued salicylate therapy. It is naturally of no value in dental haemorrhage due to other causes, such as scurvy or purpura. If there is no urgency it can be given orally as acetomenaphthone, 20 mg. daily, for two or three days before the extraction. Should there be any urgency, however, it should be given parenterally; intramuscular injection is painful, so 20 mg. of a water-soluble preparation should be given intravenously.

Disinfectants in the Lavatory Pan

Q.—*To what extent is it safe to use bleaching agents and disinfectants in a lavatory pan which drains into a cess-pit?*

A.—It is not clear what is meant by a "cess-pit." If this is a cesspool, a mere receptacle for the retention of sewage without any attempt at purification, the admission of disinfectants or bleaching agents is of no importance.

If, however, the "cess-pit" is a septic tank, the bacterial process will be discouraged by the introduction of disinfectants, which should not be used. A bleaching agent, however, would normally be diluted by bath water, etc., to such an exent as to render its presence unimportant.

NOTES AND COMMENTS

"Stripping" for Varicose Veins.—Mr. HAROLD DODD (London, W.1) writes: Your contributor's reply to the question, "What place has the operation of 'stripping' in the treatment of varicose veins?" damns the method by faint praise ("Any Questions?" December 12, 1953, p. 1334). Actually this procedure, preceded by an efficient sapheno-femoral or saphenopopliteal ligation, is the operation of choice for varicose veins. We are indebted to Myer for an efficient stripper. I started stripping the saphenous trunks in 1951, and since January 1, 1953, have used it exclusively on 170 legs. Before this, I did a five-year series of over 700 operations for varicose veins, which consisted in "top" ties followed by internal abrasion and fractional sclerosing injections of the saphenous trunk. This gave over a 90% "cure" or "much improved" rate in patients followed-up for over two to five years. The stripping procedure promises equally good results without the need for so many subsequent sclerosing injections. For instance, in my out-patients, before using stripping, it was usual to give 25–30 sclerosing injections per session; it is now down to four to six, during which time 30–40 patients with varicose veins will be seen. As your contributor says, the method tears off the tributaries, which afterwards thrombose; there is also subcutaneous bruising and staining for a fortnight or so, but neither are of temporary or remote disadvantage; in fact the after-progress is singularly trouble-free considering that the method is a comparatively crude one. After stripping, as in all operations below the diaphragm in adults, there is the need for constant movement and early ambulation, and further, on the slightest pain in the calf, suggesting deep thrombosis, anticoagulants must be given, an elastic bandage applied, and exercises steadily maintained, sedatives being administered to enable patients to do so. In the hands of those interested in varicose veins, stripping is now established and it has placed in the hands of general surgeons an effective remedy for varicosis which when done with the same care that is usual for a hernia is as free from risk and as effective. I think that shortly stripping of varicose veins will appear on the operating lists of general surgeons with the same regularity that a radical cure of a hernia or appendicectomy does, and that out-patient operations for varicose veins will be shortly abandoned and given the same sort of disapproval as is now given to out-patient tonsillectomies, although it is only ten years or so since they were fairly general practice.

OUR EXPERT replies: The questioner asked what place the operation of "stripping" had in the treatment of varicose veins, and the first sentence of the reply was as follows: "It is difficult to say exactly what place the operation of 'stripping' has in the treatment of varicose veins, but it is certain that at the present time this type of operation is carried out by only few surgeons." This surely represents a cautious attitude of mind towards the reintroduction of a technique which had once been abandoned. Many of the objections to this blind type of surgery, which tears across veins, including deep communicating ones, must remain, and Mr. Dodd's experience of the method is still fairly recent. One pertinent question that must be asked is, how often does deep thrombosis actually occur with the present method of stripping? In any case the variety of clinical pictures presented by varicose veins makes it unlikely that any one type of operation or procedure will meet all requirements. It is certainly premature to suggest that the stripping operation can be compared with the radical cure of a hernia or with an appendicectomy.

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